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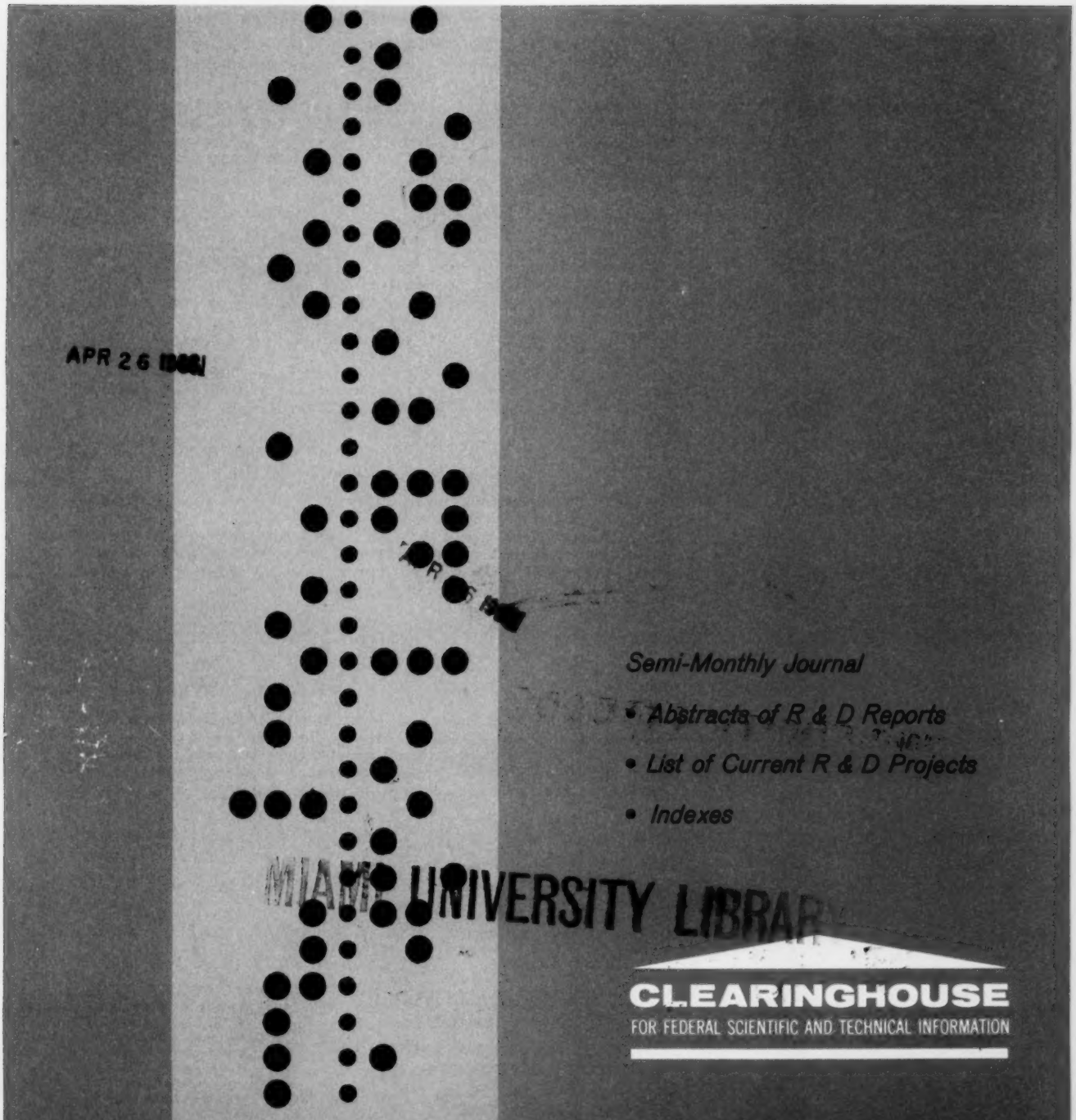
*April 10, 1966*

# U.S. GOVERNMENT RESEARCH & DEVELOPMENT REPORTS



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*Semi-Monthly Journal*

- *Abstracts of R & D Reports*
- *List of Current R & D Projects*
- *Indexes*

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*April 10, 1966 / Volume 41, Number 7*

# *U.S. Government* RESEARCH AND DEVELOPMENT REPORTS

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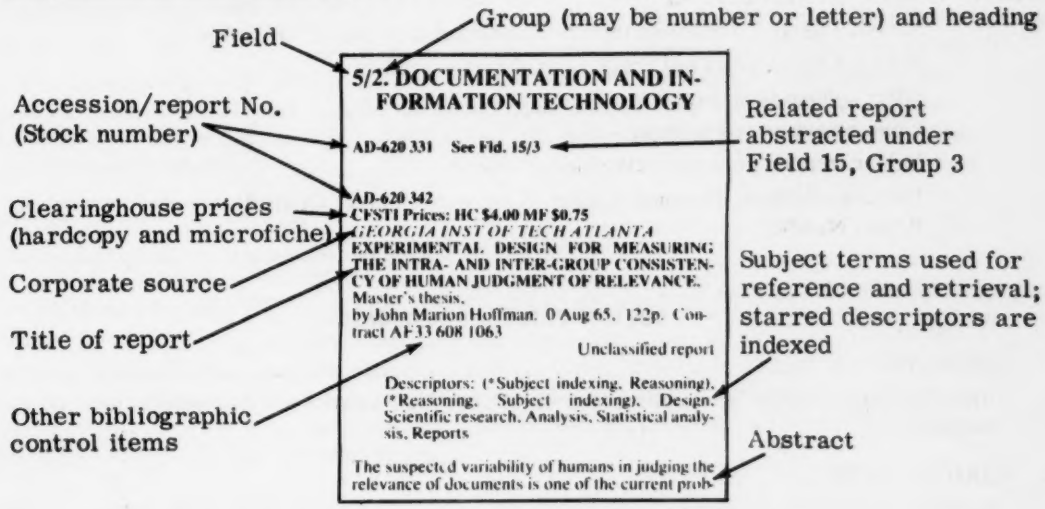
- TECHNICAL ABSTRACT BULLETIN
- OTHER RESEARCH REPORTS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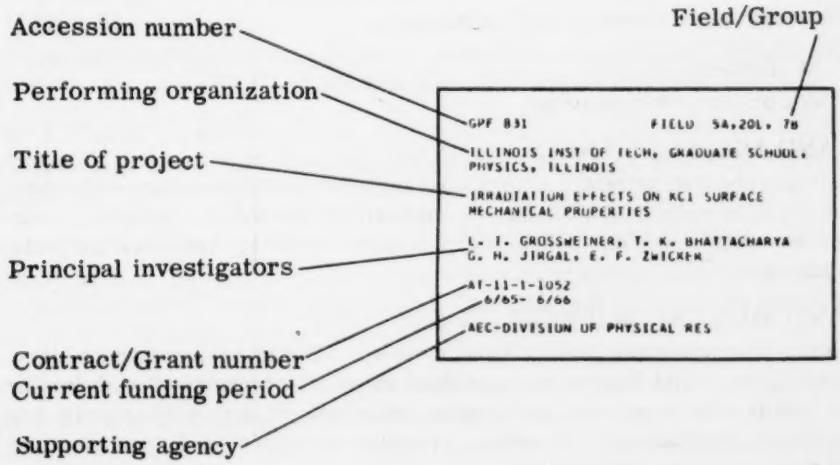


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| 06 | BIOLOGICAL AND MEDICAL SCIENCES<br>Includes biochemistry; bioengineering; biology; bionics; clinical medicine; environmental biology; escape, rescue, and survival; food; hygiene and sanitation; industrial (occupational) medicine; life support; medical and hospital equipment and supplies; microbiology; personnel selection and maintenance (medical); pharmacology; physiology; protective equipment; radiobiology; stress physiology; toxicology; and weapon effects. | 16, S-7 |

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Includes biological oceanography; cartography; dynamic oceanography; geochemistry; geodesy; geography; geology and mineralogy; hydrology and limnology; mining engineering; physical oceanography; seismology; snow, ice, and permafrost; soil mechanics; and terrestrial magnetism.

09 ELECTRONICS AND ELECTRICAL ENGINEERING ..... 50, S-13
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10 ENERGY CONVERSION (Non-Propulsive) ..... 59, S-16
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11 MATERIALS ..... 61, S-16
Includes adhesives and seals; ceramics, refractories, and glasses; coatings, colorants, and finishes; composite materials; fibers and textiles; metallurgy and metallography; miscellaneous materials; oils, lubricants, and hydraulic fluids; plastics; rubbers; solvents, cleaners, and abrasives; and wood and paper products.

12 MATHEMATICAL SCIENCES ..... 66, S-20
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13 MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING ..... 73, S-20
Includes air conditioning, heating, lighting, and ventilating; civil engineering; construction epuipment, materials, and supplies; containers and packaging; couplings, fittings, fasteners, and joints; ground transportation equipment; hydraulic and pneumatic equipment; industrial processes; machinery and tools; marine engineering; pumps, filters, pipes, tubing, fittings, and valves; safety engineering; and structural engineering.

14 METHODS AND EQUIPMENT ..... 79, S-21
Includes cost effectiveness; laboratories, test facilities, and test equipment; recording devices; reliability; and reprography.

15 MILITARY SCIENCES ..... 81
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18 NUCLEAR SCIENCE AND TECHNOLOGY ..... 84, S-23
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19 ORDNANCE ..... 85, S–26
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20 PHYSICS ..... 85, S–27
Includes acoustics; crystallography; electricity and magnetism; fluid mechanics; masers and lasers; optics; particle accelerators; particle physics; plasma physics; quantum theory; solid-mechanics; solid-state physics; thermodynamics and wave propagation.

21 PROPULSION AND FUELS ..... 114, S–31
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22 SPACE TECHNOLOGY ..... 115, S–31
Includes astronautics; spacecraft; spacecraft trajectories and reentry; and spacecraft launch vehicles and ground support.

# RESEARCH highlights

*Reports of current high industrial interest*

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## Optics

### WAVEGUIDE COMPONENTS ESTABLISHED FOR SOPHISTICATED LASERS

(Order Stock No. N66-16086 Development of Macroscopic Waveguide and Waveguide Components for Optical Systems, HC $5.00/MF $1.00.)

Theory of operation and feasibility of construction of single-mode macroscopic optical waveguide and waveguide components have been established by Wheeler Laboratories. Wheeler says such components are expected to be required for sophisticated laser systems. An analysis of optical components constructed in waveguide has shown that the concept developed provides significant advantages in performance over similar components operating in a free-space medium. Wheeler calculated the requirements for maintaining single-mode propagation with large size waveguide, and found that as waveguide size is increased, the difference in dielectric constants between core and cladding must be decreased. A convenient means for representing these relationships on a mode chart has been developed. This chart indicates the number of modes which will propagate in a waveguide of any size and difference in dielectric constant. The distribution of fields within the waveguide has been calculated in general form, and specific results plotted for a few low-order modes at typical operating conditions. The field patterns have been measured experimentally using a liquid-core slab waveguide, and results are in good agreement with the calculated curves.

## Data Processing

### BETTER LOOK-UP TECHNIQUES SAVE COMPUTER RUNNING TIME

(Order Stock No. K-DP-515 Table Look-Up Techniques for Computer Programming, HC $1.00/MF $0.50.)

Techniques for looking up information in a table from a computer programming standpoint are described in a publication prepared by Union Carbide. According to a National Bureau of Standards evaluator, "it is a useful and succinct compilation for the practicing programmer," assuming he understands basic computer concepts and programming. Union Carbide says the use of the look-up techniques offers potential savings of computer running time which can result from the programmer who understands and uses better look-up methods. The techniques include these searches: the sequential, the merge, the binary, the formula, and the computed position look-up. In the sequential search the data item key is compared with each table item key until a match is found at all table positions. The merge search is actually a sequential search technique that requires the table and data to be ordered or sorted in the same sequence on the key involved. The binary search, a position-related technique, provides that each look into the table finds the key in question or eliminates half of the table positions. The formula search introduces the concept of key-position related methods. Finally, in the computed position look-up this relation must be determined or known in advance of the table read-in because table items are stored in a position which is a function of the key value. Thus, the table storage allocation must include positions for all possible table items whose keys are in the range. This technique is perhaps inherently the fastest of any when it can be used.

### STEPWISE REGRESSION ANALYSIS PROCEDURE IMPROVED

(Order Stock No. AD-625 328 An Improved Stepwise Regression Analysis Procedure, HC $3.00/MF $0.50.)

An improved stepwise regression analysis procedure for estimating an empirical linear relationship between variables is being used throughout the U.S. Naval Civil Engineering Laboratory, in particular for management science tasks. This least squares method is implemented by the very powerful but flexible computer program STRAP with FORMAT, Version 2, for the small scale IBM 1620 computer. The program has capabilities that are usually found only on very large machines, if at all. For instance, the program allows either of two fixed formats for input data, or else allows a FORTRAN-like specification of the format of the data as part of the input. The curve may be forced through the origin if required, weighting of observations is allowed, and extra variables may be read in at any time. The F value may be set at the 5 percent level at each step. Variables may enter the regression equation in a stepwise manner in three different ways: forced in and never removed (ordinary regression analysis); forced in and tested for removal; and tested for entering and removal. Once the equation is determined, predicted versus the observed values, residuals and confidence limits on the mean or the predicted values may be tabulated. Tabulation of confidence limits at other than the observed values may be accomplished; many other statistics are optional. According to the Navy, the program has let them obtain many needed statistics that were not before readily available. The time between problem formulation and solution has been reduced, and the costly job of repunching the data has been eliminated when the problem required reformulation.

ALGORITHMS COMPILED BY ARGONNE

(Order Stock No. ANL-7054 Collected Algorithms 1960-1963, HC $5.00/MF $1.00.)

Argonne National Laboratory has compiled computer programs in the ALGOL programming language, evaluated and certified, consisting of the algorithms appearing in Communication of the Association for Computing Machinery from Feb. 1960 to Dec. 1963. Argonne notes that although ALGOL's use as a machine input language has grown rather slowly in the United States, it is the internationally accepted method of describing numerical calculation in most journals devoted to computation.

## Management Control, Decision Systems

PLANNING GUIDE COMPILED FOR COMPUTER PROGRAM DEVELOPMENT

(Order Stock No. AD-465 228 Planning Guide for Computer Program Development, HC $4.00/MF $1.00.)

A planning guide for managers of computer program development groups has been prepared by System Development Corporation for the Office of Naval Research. According to a National Bureau of Standards evaluator, "The Guide should have wide interest both in government and industry; very little usable material of this sort has yet been published." The publication offers a systematic approach for planning projects to develop computer-based information systems. It places primary emphasis on the computer program portion of such systems. Forming the basis for a set of prescribed planning and management tasks, a descriptive model of the development process includes these phases: System Analysis, System Design, Program Development, Program Coding, Program Checkout, User Documentation, User Training and Assistance, and Turnover. Each phase is further divided into tasks and subtasks for the purpose of more clearly understanding the elements of the development process. A detailed sequence of planning activities provides guidance for planning, scheduling, and costing the tasks that comprise the development process. The Guide also supplies forms to record the planning results and to serve as checklists for the required work. These forms and procedures also provide a basis for project control and for collection of data that may be used to improve estimates based upon experience. "Although this Guide was prepared for use at the Naval Command Systems Support Activity," says the System Development Corporation, "the material can easily be adapted to apply to programming in other organizations."

AIR FORCE-AIA PROCEEDINGS ON DATA MANAGEMENT PUBLISHED

(Order Stock No. AD-626 032 Proceedings of Air Force/Industry Data Management Symposium, HC $7.00/MF $1.50.)

The Proceedings of the 1965 Air Force/Industry Data Management Symposium held at Beverly Hills, Calif., and sponsored by the Air Force and Aerospace Industries Association, have now been published. Panels at the conference explored 41 problem areas and recommended solutions or new approaches in data management concepts. The panels dealt with acquisition of contractor data, rights in data and warranty, estimating data costs, and new frontiers of data management. "The symposium," said Maj. Gen. H. J. Sands, Jr., the general chairman, "served to make industry and the Air Force more aware of the significance of data as the common tool of management."

## Transportation (Land, Sea, Air, Space)

### HIGHWAY SAFETY RESEARCH PROGRAMS LISTED

(Order Stock No. PB-169 213 Highway Safety Organizations and Resources in the United States, HC $3.00/MF $0.75.)

Highway safety research organizations and resources in the United States are listed in a publication of the Bureau of Public Roads, U.S. Department of Commerce. The publication briefly describes the research programs and lists the publications of the Bureau of Public Roads, the Division of Accident Prevention of the U.S. Public Health Service, the National Safety Council, and 12 state and independent organizations involved in highway safety projects for 1965. It gives estimated financial commitments for 1965 highway safety research projects broken down by type of safety program: driver, vehicle, highway, and systems.

## Chemical Processing

### VAPOR AND LIQUID DENSITIES OF ALKALI METALS MEASURED

(Order Stock No. ANL-7025 Critical Temperatures and Densities of the Alkali Metals, HC $3.00/MF $0.75.)

Vapor and liquid densities of the alkali metals sodium, potassium, rubidium and cesium have been measured from room temperature to near the critical points at the Argonne National Laboratory. The measurements were made by a method which uses radioactive isotopes of the alkali metals in which the measured radiation is proportional to the density of the vapor or liquid. Argonne obtained the critical temperature and critical density by several methods of correlation. These included the rectilinear diameter plots of Cailletet and Mathias, correlations developed by Rowlinson and by Kordes, and a generalized correlation of reduced density with reduced temperatures. The study shows that the alkali metals deviate somewhat from the "law of corresponding states" based on nonmetallic substances. Argonne's program report says, "The method of measurement employed could also be used in many cases to determine vapor and liquid densities at high temperatures for metals, alloys, fused salts, and other materials."

### OSCILLOSCOPE TRACES AUTOMATICALLY ANALYZED

(Order Stock No. ANL-7113 A Method for Automatic Analysis of Data on the Kinetics of Fast Chemical Reactions in the Form of Pictures of Oscilloscope Traces, HC $1.00/MF $0.50.)

Argonne National Laboratory has devised a method for automatically analyzing pictures of oscilloscope traces. The method uses a machine -- called CHLOE by Argonne -- that determines the x, y coordinates of significant features on the picture. It produces a magnetic-tape record of the coordinates at specified intervals of the various curves of the picture. Argonne uses the CHLOE system in conjunction with the Control Data 3600 Computer system to analyze data on the kinetics of fast chemical reactions. Their report describes the CHLOE system and the computer programming.

VALVELESS GAS CHROMATOGRAPH DEVELOPED FOR HIGH TEMPERATURES

(Order Stock No. UCRL-14359 Apparatus for Automatic Preparative Gas Chromatography, HC $1.00/MF $0.50.)

For many analytical as well as synthesis problems, it is desirable to obtain pure compounds by means of chromatographic techniques. Since many of these applications require high operating temperatures, a valveless system is desirable. The Lawrence Radiation Laboratory has prepared such a system and has also developed operational data. The sample injection system is pneumatically operated. An inert gas pressure applied for a preset time forces the sample from a reservoir through a capillary needle onto the chromatographic column. By the proper adjustment of the three parameters involved, a sample can be admitted in near plug condition. All valves and other moving mechanisms are eliminated from the area between the column exit and the collection traps. This allows the necessary temperature control without the risk of leaks. Capillary tubing is used to connect the column exit to the individual traps. Trap selection is by means of automatic valves located at the exits of the traps. These valves direct the carrier gas path through the various traps.

## Nuclear Technology

TABLE OF 10,000 MASSES FOR NUCLEI PREPARED

(Order Stock No. LA-3380-MS A Table of Binding Energies and Particle Separation Energies From a Mass Law, HC $4.00/MF $0.75.)

A table of approximately 10,000 masses for nuclei with atomic numbers between 22 and 120 and number of neutrons between 22 and 184 has been prepared by the Los Alamos Scientific Laboratory. This table of binding energies and particle separation energies is from the mass law developed by Los Alamos physicist Philip A. Seeger for application to the astrophysical problem of nucleosynthesis by rapid neutron capture.

MAGNET TECHNOLOGY SYMPOSIUM PAPERS IN PRINT

(Order Stock No. CONF-650922 Proceedings of the International Symposium on Magnet Technology, HC $8.50/MF $3.50.)

The Proceedings of the International Symposium on Magnet Technology held at Stanford University's Linear Accelerator Center, Sept. 8-10, 1965, have been published. The 90 papers presented at the symposium are arranged in the Proceedings in 5 parts: Magnet Technology and Field Analysis, Magnet Engineering, Field Measurement, Superconducting and Special Purpose Magnets, and Power Supply Engineering. The 315 scientists and engineers from 9 countries who attended the symposium were brought together under Stanford and Lawrence Radiation Laboratory sponsorship with support of the Atomic Energy Commission. The symposium's objective was to bring about a closer communication among different laboratories and manufacturers, and among designers, builders, and users of magnets for handling beams of charged particles.

## Biological and Medical Sciences

### BROOKHAVEN'S GENETIC CONTROL PROCEEDINGS AVAILABLE

(Order Stock No. BNL-931(C-44) Genetic Control of Differentiation, HC $3.00/MF $1.50.)

The Proceedings of the 1965 Genetic Control of Differentiation Symposium sponsored by Brookhaven National Laboratory offer excellent samplings of the new research in this area. Session topics under which papers are grouped are biochemical level, lower forms, multicellular animals, plant development, and the chromosome level. The symposium committee notes in the introduction that anticipation of a breakthrough in solving key problems of the genetic control of differentiation has led to increasing research toward this goal in areas that associate the disciplines of cytogenetics, biochemistry, microbiology, embryology, and morphology. Results with maize, combined with findings in biochemical and microbial genetics, have shown that there are identifiable controlling elements in the nucleus that are instrumental in turning on or off the activity of structural genes.

### TREATMENT SCHEDULES FOR CANCER CHEMOTHERAPY CALCULATED

(Order Stock No. UCRL-14505 The Calculation of Treatment Schedules for Cancer Chemotherapy, HC $1.00/MF $0.50, and UCRL-14505, same title, Part II, HC $2.00/MF $0.50.)

The calculation of the complex dynamic response of neoplastic tissues and host tissues to the scheduled administration of chemotherapeutic agents is discussed in two reports prepared by the Lawrence Radiation Laboratory. Using information available in the literature, Lawrence constructed a model of the growth process in simple neoplastic tissues and in rapidly multiplying host tissues. This model has been made quantitative, and a computing machine procedure has been worked out so that the effects of schedule selection can be rapidly evaluated.

### METHODS FOUND FOR VIRUS COLLECTION AND IDENTIFICATION

(Order Stock No. AD-627 371 Unique Methods of Viral Collection and Identification, HC $3.00/MF $0.75.)

Three promising methods for virus collection and identification have been found among 20 techniques examined by the Midwest Research Institute. The methods chosen have the potential for identifying 100 plaque-forming units in 6 hours and are suitable for eventual automation. The first method, known as in vitro phagocytosis, involves the reaction of immune white blood cells with antigen to produce cellular changes or lysis which can be monitored microscopically and/or by the measurement of released fluorescent particles or materials. In the second technique, known as the synthetic membrane approach, there is an alteration of the electrical properties of phospholipid bilayer membranes by virus-antibody-complement complexes. Particle electrophoresis of antibody coated particles constitutes the third procedure.

## Metalworking and Metal Forming

### ISOSTATIC HOT-PRESSING SYSTEM DEVELOPED FOR LARGE COMPACTS

(Order Stock No. Y-1487 Isostatic Hot Pressing, HC $3.00/MF $0.75.)

An isostatic hot-pressing system has been developed by Union Carbide for use at 15,000 to 30,000 psi for large compacts. Process demonstrations have illustrated the practicality of the system with 8-inch diameter bars at 2000°C and 12-inch diameter bars at 1200°C. Furthermore, the data indicate that a modification of the existing equipment will provide capacity to 40 inches in diameter at 2500°C and 30,000 psi. The pressing is accomplished by high-pressure oil or water acting on a directly heated specimen via a sand medium that is inert, insulating, nonforming, and pressure transmitting. In the course of this development, Union Carbide evolved a simple, inexpensive, disposable refractory metal furnace and accomplished 24 successive pressings without a single case of leakage.

### MAGNETIC-PULSE FORMING PROCESS IS EFFICIENT

(Order Stock No. Y-1483 An Investigation of the Magnetic-Pulse Forming Process, HC $4.00/MF $0.75.)

In certain applications, the magnetic-pulse forming process is more efficient than explosive forming and electrohydraulic processes, says a Union Carbide report. The report lists and discusses the advantages and limitations that this new metal-forming process has to offer for forming metal at high strain rates. The investigators developed equations for predicting forming pressure, velocity of metal movement, and current-penetration depth in the parts to be formed. The report also includes reference charts for plotting the annular volume between the magnetic-pulse forming coils and the part to be formed as a function of the forming pressure available at energies from 1,000 to 45,000 joules. A chart plots the current-penetration depth as a function of the circuit-ringing frequency. The report discusses different types of forming coils and the typical parts that may be readily formed using this process. For example, thin metal sheaths can be compressed onto a relatively massive component without damage to the component because of the comparatively small amount of energy which can be transferred from the moving sheath.

### ELECTROMAGNETIC HAMMER REMOVES DISTORTION IN METALS

(Order Stock No. N66-12344 The Electromagnetic Hammer, HC $0.25/MF $0.50.)

A method that uses electromagnetic forces for removing the distortion from welded components has been developed by NASA's G. C. Marshall Space Flight Center. Battelle Memorial Institute has studied the apparatus and concludes that there should be many applications for it in metal-working operations where relatively uniform pressure is to be applied over a localized area. The method uses a pancake electromagnetic coil driven by electric-discharge equipment to correct distortion in metal components such as welded rocket fuel tanks, gore segments, and bulkheads. The process is unusual in that no tooling other than the magnetic coil is required, and there are no moving parts. Only electrically conductive materials, however, can be worked over by the device. Since the device does not involve the use of tools which contact the material over the area to be formed, it does not cause nonuniform deformation. Any type of distortion which can be corrected by slight bending or stretching of the metal serves as a potential candidate for electromagnetic action, including the removal of heat-treating distortion.

## Ceramics, Refractory Materials (Non-Metallic)

### BINDERS EVALUATED FOR MACHINABLE UNFIRED CERAMICS

(Order Stock No. RFP-659 Evaluation of Binders for Machinable Unfired Ceramics, HC $1.00/MF $0.50.)

Of 27 different combinations of binders mixed with powder compacts of oxide ceramics, Dow Chemical Co. finds that polyvinyl alcohol gives the highest tensile strengths. Such strength increases are vital because Dow also finds that machinability improves as binder tensile strength increases. The firm says machinability is related to binder tensile strength in the following way: Tensile strengths of 150-300 psi are necessary for fabricating short parts with a smooth finish, and strengths of 300-600 psi are required for machining longer parts with even smoother finishes. Thus, using standard machine tools, unfired oxide compacts can be bored, broached, threaded, turned, and milled. Dow Chemical also impregnated isostatically pressed oxides with waxes to further increase their mechanical strengths for machining. In the polyvinyl alcohol tests, the researchers used 4 percent of this binder in alumina, magnesia, zirconia, and zircon bars.

## Electronics

### TRANSIENT CLEANUP OF DEUTERIUM PROBED

(Order Stock No. AD-625 389 Further Studies of Hydrogen and Deuterium Clean-up, HC $2.00/MF $0.50.)

The increasing use of deuterium as a fill gas to replace hydrogen in thyratrons, clippers, and rectifiers has prompted the Fort Monmouth Electronics Command to study the transient cleanup phenomena of this isotope. Transient cleanup, which has plagued these devices for the last 20 years, refers to the gas that is occluded by the tube parts under discharge conditions and is desorbed immediately upon extinction of the discharge. Permanent cleanup refers to the occluded gas that is not recoverable without special processing. Both transient and permanent cleanup are influenced by the discharge conditions and the physical state and history of the tube materials. The growing interest in deuterium has come about because of its apparent ability to hold off greater voltages than hydrogen under the same conditions. It also provides a lower arc drop in the gas, but at the same time it has the disadvantage of a longer recovery time after a pulse because of its increased mass. The Fort Monmouth study determined that hydrogen and deuterium transient cleanup obey the same fundamental relationship with respect to discharge parameters. In both cases the percent cleanup under dynamic operating conditions is directly proportional to the square root of the power dissipated in the tube. There were no apparent differences in the solubility factor of the equation; the prime difference in the behavior of both gases was determined to be the difference in diffusion rates. The ratio of diffusion constants of atomic hydrogen to atomic deuterium was measured to be 1.4:1, which is in agreement with theory. On the basis of these measurements, Fort Monmouth engineers hypothesize that in earlier experiments the longer life experienced with tubes using admixtures of hydrogen isotopes was due to differences in diffusion constants. That is, the heavier the isotope, the slower the cleanup.

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# CURRENT research & development PROJECTS

## 01. Aeronautics

NIL 50 FIELD 7C, 7D, 7A,20D

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, AERONAUT + ASTRONAUT, ILLINOIS

REFLECTED SHOCK WAVE NON-IDEALITY
R. A. STREHLOW, H. B. DYNER
/65- /

ILLINOIS, UNIVERSITY OF

NIL 52 FIELD 20D

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, AERONAUT + ASTRONAUT, ILLINOIS

AIRFOIL WITH BLOWING MAGNUS FLAP
R. W. MCCLOY, H. H. CHEN
/65- /
ILLINOIS, UNIVERSITY OF

NIL 54 FIELD 20M,20D,10B

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, AERONAUT + ASTRONAUT, ILLINOIS

OPTIMIZATION OF STAGED EJECTOR SYSTEMS
J. L. LOTH
/65- /
ILLINOIS, UNIVERSITY OF

NIL 57 FIELD 10,20D,20K

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, AERONAUT + ASTRONAUT, ILLINOIS

CABIN NOISE INDUCED BY BOUNDARY LAYER TURBULENCE
Y. K. LIN, T. C. CHEN
/65- /
ILLINOIS, UNIVERSITY OF

## 03. Astronomy and Astrophysics

GH 77 2 FIELD 3A, 3B,14E

US, SMITHSONIAN INST, DIST OF COLUMBIA
SYSTEMATIC IN-FLIGHT PHOTOGRAPHY AND SUBSEQUENT RECOVERY OF METEORITES
F. L. WHIPPLE
NASA-NSG-291-3S-1
1/65-12/65
NASA

GSP 1269 2 FIELD 3B, 3A, 9A, 9A

LOWELL OBSERVATORY, FLAGSTAFF, ARIZONA
INTERFEROMETRIC SPECTROSCOPY AND PHOTOELECTRIC PHOTOMETRY
W. M. SINTON
NSF-GP-2322
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1977 1 FIELD 3A, 3B, 9A, 9C

UNIVERSITY OF ARIZONA, GRADUATE SCHOOL, ASTRONOMY, ARIZONA
INFRARED PHOTOMETRY
H. L. JOHNSON
NSF-GP-3736
11/65-11/66

NSF-PHYSICAL SCIENCES DIVISION

## 04. Atmospheric Sciences

IGM 11577 3 FIELD 4A,20J,20F

UNIVERSITY OF ALASKA, AGRICULTURAL EXPT STA, HORTICULTURE, ALASKA

MEASUREMENT OF LIGHT QUALITY OF THE NATURAL SPECTRUM
C. H. DEARBORN, R. J. ALVAREZ
W. L. DECKER, W. G. MURCRAY
9/65- 8/66
PHS-NIH-DIV GENERAL MEDICAL SCIENCES

GSP 1366 2 FIELD 4A, 5A,18A

UNIV OF CAL-BERKELEY, GRADUATE SCHOOL, PHYSICS, CALIFORNIA
ELECTRON PRECIPITATION INTO THE AURORAL ZONE
R. A. ANDERSON
NSF-GP-2252
11/65-12/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1562 1 FIELD 4A

UNIV OF WASHINGTON, GRADUATE SCHOOL, ATMOSPHERIC SCIENCE, WASHINGTON
ATMOSPHERIC MOTIONS IN THE STRATOSPHERE AND MESOSPHERE
R. J. REED
NSF-GP-2232
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

ZUA 616 3 FIELD 8D, 8H, 4B

USDI, GEOL SURV, DIST OF COLUMBIA
ATMOSPHERIC CHEMISTRY
A. W. GAMBELL
INT-GS-ACA-17-F
/66- /
INTERIOR-GEOLOGICAL SURVEY

## 06. Biological and Medical Sciences

QD 430 1 FIELD 6B, 9A

BRIGHAM PETER BENT H, MASSACHUSETTS
THE DEVELOPMENT OF A CATHETER-TIP THERMISTOR FLOW-METER
G. U. BARNETT
1/65- 6/66
LIFE INSURANCE MEDICAL RES FUND

## 07. Chemistry

1AI 6302 2 FIELD 7C, 7A, 7D, 7B

UNIVERSITY OF IOWA, GRADUATE SCHOOL, CHEMISTRY, IOWA
A NEW SYNTHESIS OF CINNOLINOCINNOLINES
J. K. STILLE, J. M. UNGLAUBE
9/65- 8/66
PHS-NIH-NATL INST ALLERGY + INFECT DIS

1AM 7771 2 FIELD 7C, 7A, 7D

OREGON STATE UNIV, GRADUATE SCHOOL, CHEMISTRY, OREGON
VALENCE ISOMERISM IN SYNTHESIS AND OF DIHYDROPYRIDINE

E. N. MARVELL
9/65- 8/66

PHS-NIH-NATL INST ARTHRITIS + METAB DIS

1GM 8847 5 FIELD 7D, 7A,20J, 7B

CAL INST OF TECHNOLOGY, GRADUATE SCHOOL, CHEMISTRY + CHEM ENGIN, CALIFORNIA
AIR OXIDATION OF METAL CHELATES
G. S. HAMMOND, F. FISHER, A. SHUGARMAN
C. S. WU
9/65- 8/66
PHS-NIH-DIV GENERAL MEDICAL SCIENCES

1GM 11399 3 FIELD 7C, 7A, 7D

TULANE UNIV OF LA, GRADUATE SCHOOL, CHEMISTRY, LOUISIANA
THE SYNTHESIS OF HIGHLY STRAINED ORGANIC SYSTEMS OF CHEMICAL AND POTENTIAL BIOLOGICAL INTEREST
G. W. GRIFFIN
9/65- 8/66
PHS-NIH-DIV GENERAL MEDICAL SCIENCES

1GM 11415 3 FIELD 7C, 7D, 7A

UNIVERSITY OF DELAWARE, GRADUATE SCHOOL, CHEMISTRY, DELAWARE
REMOTE FUNCTIONAL GROUP INFLUENCES ON REACTION RATE
H. KWART, S. HSIA, A. A. KHAN
C. VONFRANKENBERG
9/65- 8/66
PHS-NIH-DIV GENERAL MEDICAL SCIENCES

1GM 11578 3 FIELD 7D, 7C, 7B

HARVARD UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, MASSACHUSETTS
FAR INFRARED SPECTROSCOPY
W. A. KLEMPERER
9/65- 8/66
PHS-NIH-DIV GENERAL MEDICAL SCIENCES

1GM 12306 2 FIELD 7C, 7D,20J

EMORY UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, GEORGIA
STUDY OF FLAVIN AND NICOTINAMIDE DIMERS
S. P. PAPPAS, B. C. PAPPAS
9/65- 8/66
PHS-NIH-DIV GENERAL MEDICAL SCIENCES

1GM 12472 2 FIELD 7D,20J, 7B

OKLAHOMA STATE UNIV, GRADUATE SCHOOL, CHEMISTRY, OKLAHOMA
THE H BOND AS A NON-BONDED INTERACTION
J. P. DEVLIN
9/65- 8/66
PHS-NIH-DIV GENERAL MEDICAL SCIENCES

1GM 12800 1 FIELD 7C, 7A, 7D,20M

YALE UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, CONNECTICUT
A STUDY OF UNUSUALLY REACTIVE CARBOCYCLIC COMPOUNDS
K. B. WIBERG
10/65- 9/66
PHS-NIH-DIV GENERAL MEDICAL SCIENCES

1GM 12830 2 FIELD 7D,20J, 7B

UNIVERSITY OF MISSOURI, GRADUATE SCHOOL, CHEMISTRY, MISSOURI
THE DETERMINATION OF TRACE AMOUNTS OF SELENIUM
P. F. LOTT
9/65- 8/66
PHS-NIH-DIV GENERAL MEDICAL SCIENCES

1GM 13976 1 FIELD 7C, 7D

UNIV OF WISCONSIN, GRADUATE SCHOOL, CHEMISTRY, WISCONSIN



211-291 O - 66 - 8

POLYMER SORBATE INTERACTIONS
W. W. BRANDT
9/65- 5/66
PHS-NIH-DIV GENERAL MEDICAL SCIENCES

1GM 13985 1 FIELD 7D,20J, 7B

UNIV OF SOUTH CAROLINA, GRADUATE SCHOOL, CHEMISTRY, SOUTH CAROLINA
MOLECULAR STRUCTURE AND SPECTRA OF METAL CHELATES
E. L. AMMA
9/65- 8/66
PHS-NIH-DIV GENERAL MEDICAL SCIENCES

7GX 587 3 FIELD 7D, 8H, 7B

UNIV OF NORTH CAROLINA, SCHOOL OF PUBLIC HLTH, SANITARY ENGINEERING, NORTH CAROLINA
DIRECT GAS CHROMATOGRAPHY OF ORGANICS IN WATER
C. M. WEISS, J. D. JOHNSON
7-WP-00563-03
9/65- 8/66
PHS-BSS

7GX 594 3 FIELD 7A, 7D

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, CHEMISTRY + CHEM ENGIN, ILLINOIS
MASS TRANSFER THROUGH INTERFACES
J. A. QUINN, L. M. BLAIR, R. O. MASS
W. T. MITCHELL, R. E. PLEVEN
D. S. PRENSNER, G. D. ROSE
7-WP-00601-03
9/65- 8/66
PHS-BSS

GPF 257 3 FIELD 7D, 7C, 7A,20J

STATE UNIV N Y BUFFALO, GRADUATE SCHOOL, CHEMISTRY, NEW YORK
APPLICATIONS OF ISOTOPES IN CHEMICAL KINETICS
G. M. HARRIS, P. M. BROWN, H. KELM
AT(30-1)-1518
9/65- 8/66
AEC-DIVISION OF PHYSICAL RES

GPF 509 4 FIELD 7C, 7D, 7A, 9+

UNIV OF WISCONSIN, GRADUATE SCHOOL, CHEMISTRY, WISCONSIN
KINETIC AND MASS TRANSFER PROCESSES IN ELECTROCHEMISTRY, APPLICATION TO ANALYTICAL METHODS
I. SHAIN, J. P. HABERMAN, M. H. HULBURT
D. R. SCHROEDER, M. S. SHUMAN
AT-11-1-1083
10/65- 9/66
AEC-DIVISION OF PHYSICAL RES

GPF 704 4 FIELD 7D, 7C, 7A, 7B

ARIZONA STATE UNIV, GRADUATE SCHOOL, CHEMISTRY, ARIZONA
SOLID STATE CHEMISTRY OF RARE EARTH OXIDES
L. EYRING, D. A. BURNHAM, P. CARO
T. FELMLEE, J. KORDIS, S. H. LIN
J. SAWYER
AT(11-1)-1109
10/65-10/66
AEC-DIVISION OF PHYSICAL RES

GPF 907 FIELD 7C, 7D, 7B

UNIVERSITY OF KANSAS, GRADUATE SCHOOL, CHEMISTRY, KANSAS
RADIOLYSIS STUDIES ON FLUOROCARBONS AND ON REACTIVE INTERMEDIATES
L. KEVAN
AT-11-1-1528
9/65- 8/66
AEC-DIVISION OF PHYSICAL RES

GSH 665 3 FIELD 3A, 7C, 7A, 7D

UNIV OF CAL-LA JOLLA, GRADUATE SCHOOL, CHEMISTRY, CALIFORNIA
SYNTHESIS OF ORGANIC COMPOUNDS UNDER PRIMITIVE EARTH CONDITIONS
S. L. MILLER, M. PARRIS

NSF-GB-2687
7/65- 6/66
NSF-BIOLOGICAL + MEDICAL SCIENCES DIVISI

GSP 542 4 FIELD 7C, 7D, 7A,20J

UNIV OF CAL-L. A., GRADUATE SCHOOL, CHEMISTRY, CALIFORNIA
STRUCTURE AND MECHANISM IN ORGANOPHOSPHORUS CHEMISTRY
P. C. HAAKE
NSF-GP-3726
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 631 4 FIELD 7C, 7D

MASS INST OF TECHNOL, GRADUATE SCHOOL, CHEMISTRY, MASSACHUSETTS
HIGH RESOLUTION MASS SPECTRA OF COMPLEX ORGANIC MOLECULES
K. BIEMANN
NSF-GP-3734
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 701 4 FIELD 7C, 7D,20J, 7B

PURDUE UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, INDIANA
STRUCTURE AND REACTIVITY
H. C. BROWN
NSF-GP-3719
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 755 4 FIELD 7C, 7D

UNIV OF WISCONSIN, GRADUATE SCHOOL, CHEMISTRY, WISCONSIN
SYNTHETIC ORGANIC CHEMISTRY
H. MUXFELDT
NSF-GP-3696
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1400 2 FIELD 7C, 7D, 7B

DUKE UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, NORTH CAROLINA
SYNTHETIC APPLICATIONS OF CONDENSATIONS, REARRANGEMENTS, AND METALATION REACTIONS TO ORGANIC CHEMISTRY
C. R. HAUSER
NSF-GP-2274
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1652 2 FIELD 7C, 7A, 7D,20J

UNIVERSITY OF UTAH, GRADUATE SCHOOL, CHEMISTRY, UTAH
LIQUIDS, RATE PROCESSES, OPTICAL ACTIVITY, AND HIGH PRESSURE
C. J. CHRISTENSEN
NSF-GP-3698
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1941 1 FIELD 20J, 5A, 7B

PURDUE UNIVERSITY, GRADUATE SCHOOL, PHYSICS, INDIANA
ATOMIC BEAM SPECTROSCOPY OF RARE GASES
R. W. STANLEY
NSF-GP-3747
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1943 1 FIELD 7C, 7A, 7D,20M

UNIVERSITY OF MICHIGAN, GRADUATE SCHOOL, CHEMISTRY, MICHIGAN
VAPOR PHASE STUDIES OF CHARGE TRANSFER COMPLEXES
M. TAMRES
NSF-GP-3691
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1947 1 FIELD 7C, 7A, 7D,20J

UNIV OF ROCHESTER, GRADUATE SCHOOL, CHEMISTRY, NEW YORK
ISOTOPE EFFECTS IN ELIMINATION REACTIONS
W. H. SAUNDERS
NSF-GP-3720
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1952 1 FIELD 7C, 7D,20J
UNIV OF TEXAS, AUSTIN, GRADUATE SCHOOL, CHEMISTRY, TEXAS
THE INTERSYSTEM CROSS-OVER BETWEEN STATES OF DIFFERENT MULTIPLICY AND ITS RELATIONSHIP TO DISSOCIATION
W. A. NOYES
NSF-GP-3731
11/65-11/66

NSF-PHYSICAL SCIENCES DIVISION

GSP 1953 1 FIELD 7C, 7D,20J

PURDUE UNIVERSITY, GRADUATE SCHOOL, CHEMISTRY, INDIANA
PRINCIPAL DIAMAGNETIC SUSCEPTIBILITIES OF ORGANIC COMPOUNDS
W. MULLER
NSF-GP-3716
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1954 1 FIELD 7C, 7D,20J, 7B

NEW MEX STATE UNIV, UNDERGRADUATE SCHOOL, CHEMISTRY, NEW MEXICO
ORGANIC DERIVATIVES OF PENTAVALENT PHOSPHORUS
J. J. MONAGLE
NSF-GP-3732
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1956 1 FIELD 7C, 7D,20M

UNIV OF WASHINGTON, GRADUATE SCHOOL, CHEMISTRY, WASHINGTON
UV SPECTROSCOPY OF TRAPPED INORGANIC RADICALS
C. B. MEYER
NSF-GP-3729
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1983 1 FIELD 7C, 7A, 7D

UNIV OF CAL-BERKELEY, GRADUATE SCHOOL, CHEMISTRY, CALIFORNIA
ION PAIRS IN SOLVOLYSIS
S. WINSTEIN
NSF-GP-3695
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1988 1 FIELD 7C, 7D,20J

UNIVERSITY OF CHICAGO, GRADUATE SCHOOL, CHEMISTRY, ILLINOIS
SKELETAL ELECTRONS - STATES AND REACTIONS
NSF-GP-3730
11/65-11/66
R. S. BERRY
NSF-PHYSICAL SCIENCES DIVISION

GUE 65 2 FIELD 7C, 7A, 7D,20M

SYRACUSE UNIVERSITY, SCHOOL OF ENGINEERING, CHEMICAL + METAL ENGIN, NEW YORK
STUDIES ON THE HYDRATE PROCESS FOR DEMINERALIZING SEA WATER
A. J. BARDUHN, R. FERNANDEZ, J. PANGBORN
7/65- 6/66
INTERIOR-OFFICE OF SALINE WATER

GUE 73 2 FIELD 7C, 7A, 7D,20J

UNIV OF CAL-BERKELEY, SCHOOL OF ENGINEERING, CHEMICAL ENGINEERING, CALIFORNIA
INTERMOLECULAR FORCES BETWEEN WATER AND NONPOLAR MOLECULES
SW-14-01-0001-349
11/65-10/66
J. M. PRAUSNITZ, C. MYRAT, J. P. OCONNELL
INTERIOR-OFFICE OF SALINE WATER

GUW 277 FIELD 7C, 7D, 8D, 8H

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CERAMIC ENGINEERING, GEORGIA

THE EXTRACTION OF POTASSIUM FROM FRESH AND SALINE WATERS BY CLAY MINERALS

C. E. WEAVER, K. C. BECK

INT-A-008-GA
/66- /

INTERIOR-OFFICE OF WATER RESOURCES

PM 1020 FIELD 7C, 7D

RUSSELL SAGE COLLEGE, NEW YORK
REACTIONS OF TRIETHYLPHOSPHITE WITH AROMATIC NITRO COMPOUNDS TO EFFECT RING CLOSURES
L. C. SMITH
9/66- 8/69
SOCIETY SIGMA XI + SC RES SOC AMER

ZXA 650211 FIELD 7C, 7D,20M,20J

U S PUBLIC HEALTH SERV, MARYLAND
STRUCTURE OF POLYADENYLIC ACID AT PH 7.
G. FELSENFELD, M. LENG
NIH-NIAMD-LMB-17
/65- /
PHS-NIH-NATL INST ARTHRITIS + METAB DIS

## 08. Earth Sciences and Oceanography

GSB 1481 1 FIELD 8C

US, SMITHSONIAN INST, DIST OF COLUMBIA
SORTING OF COLLECTIONS FROM THE INTERNATIONAL INDIAN OCEAN EXPEDITION
H. A. FEHLMANN
NSF-GB-3012
12/65-11/66
NSF-BIOLOGICAL + MEDICAL SCIENCES DIVISI

GSP 1237 2 FIELD 8D

CAL INST OF TECHNOLOGY, GRADUATE SCHOOL, PALEONTOLOGY, CALIFORNIA
EVOLUTION AND ANIMAL GEOGRAPHY OF SILURO-DEVONIAN BRACHIOPODS AND GASTROPODS
A. J. BOUCOT, L. R. JOHNSON, . MCKERROW . ZIEGLER
NSF-GP-2270
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1425 2 FIELD 8D, 8G

HARVARD UNIVERSITY, GRADUATE SCHOOL, GEOLOGY, MASSACHUSETTS
PEGMATITES IN ARGENTINA AND SOUTHERN AFRICA
C. S. HURLBUT
NSF-GP-2314
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1967 1 FIELD 8F, 8H

MONTANA STATE COLLEGE, GRADUATE SCHOOL, EARTH SCIENCES, MONTANA
SNOWPACK STRENGTH AND LOAD IN DEEP SLAB AVALANCHES
C. C. BRADLEY
NSF-GP-3692
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 2068 1 FIELD 13B, 7C, 7D, 8D

PENNSYLVANIA ST UNIV, SCHOOL OF MINERAL IND, GEOCHEM + MINERALOGY, PENNSYLVANIA
THE MECHANISM INVOLVED IN GENERATION OF X-RAY AMORPHOUS AND CRYSTALLINE ALUMINUM HYDROXIDES, IRON OXIDES, AND CLAY MINERALS
T. F. BATES
NSF-GP-3721
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 2072 1 FIELD 7A,20M, 8D, 8G

OBERLIN COLLEGE, GRADUATE SCHOOL, GEOLOGY, OHIO
VAPORIZATION AND CONDENSATION OF INORGANIC COMPOUNDS - PROBLEMS OF PETROGENESIS
R. C. SCHOONMAKER, J. L. POWELL
NSF-GP-3709
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 2075 1 FIELD 8D, 8G

BROWN UNIVERSITY, GRADUATE SCHOOL, GEOLOGY, RHODE ISLAND
NATURAL AND ARTIFICIALLY INDUCED ISOTOPIC AGE DISCORDANCES IN MINERALS
B. J. GILETTI
NSF-GP-3751
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 2078 1 FIELD 8D, 8N, 8G

CAL INST OF TECHNOLOGY, GRADUATE SCHOOL, GEOLOGICAL SCIENCES, CALIFORNIA
DEVONIAN ANIMAL GEOGRAPHY, CONTINENTAL DRIFT, AND POLAR WANDERING
A. J. BOUCOT
NSF-GP-3743
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 2079 1 FIELD 8D, 8G

UNIVERSITY OF ARIZONA, GRADUATE SCHOOL, GEOLOGY, ARIZONA
GEOCHEMICAL DATING OF PRECAMBRAIN ROCKS IN SOUTHWESTERN UNITED STATES AND MEXICO
P. E. DAMON, P. . DAMON
NSF-GP-3738
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GUM 255 FIELD 8F, 8H, 8G,12A

PENNSYLVANIA ST UNIV, SCHOOL OF MINERAL IND, MINERAL TECHNOLOGY, PENNSYLVANIA
THE •CARBONATE •HYDROGEOLOGIC •ENVIRONMENT, ITS •RELATIONSHIP TO •LAND USE, •WATER RESOURCES •DEVELOPMENT AND •MANAGEMENT
R. R. PARIZEK, R. •. PARIZEK
INT-A-005-PA
7/65- 6/66
INTERIOR-OFFICE OF WATER RESOURCES

ZUA 599 3 FIELD 8H, 8G

USDI, GEOL SURV, DIST OF COLUMBIA
RESEARCH IN SEDIMENT SAMPLING EQUIPMENT
B. COLBY
INT-GS-MCA-4-FO
/66- /
INTERIOR-GEOLOGICAL SURVEY

ZUA 637 3 FIELD 8H

USDI, GEOL SURV, DIST OF COLUMBIA
EVAPORATION FROM LAKES AND RESERVOIRS
J. S. MEYERS
INT-GS-RMA-F
/66- /
INTERIOR-GEOLOGICAL SURVEY

ZUA 646 3 FIELD 8H, 8+, 9A

USDI, GEOL SURV, DIST OF COLUMBIA
ELECTRONIC EQUIPMENT DEVELOPMENT
J. E. EDDY
INT-GS-ACA-14-F
/66- /
INTERIOR-GEOLOGICAL SURVEY

ZUA 652 3 FIELD 8D, 8H

USDI, GEOL SURV, DIST OF COLUMBIA
LIQUID MOVEMENT IN CLAYS
M. W. OLSEN
INT-GS-ACA-26-F
/66- /
INTERIOR-GEOLOGICAL SURVEY

ZUA 668 3 FIELD 8F, 8H

USDI, GEOL SURV, DIST OF COLUMBIA
GEOMORPHIC ASPECTS - SISTERS AND WATTS BRANCHES
L. B. LEOPOLD
INT-GS-MD-2-F
/66- /
INTERIOR-GEOLOGICAL SURVEY

ZUA 671 3 FIELD 8F
USDI, GEOL SURV, DIST OF COLUMBIA
BASIC PROCESSES OF EROSION AND RESULTANT LANDFORMS CHANGES
G. G. PARKER
INT-GS-RMA-142-F
/66- /
INTERIOR-GEOLOGICAL SURVEY

ZUA 673 3 FIELD 13B, 8F, 8H

USDI, GEOL SURV, DIST OF COLUMBIA
THE EFFECT OF EXPOSURE ON SLOPE MORPHOLOGY
R. F. HADLEY
INT-GS-RMA-133-F
/66- /
INTERIOR-GEOLOGICAL SURVEY

ZUA 678 3 FIELD 13B, 8D, 8H, 8G

USDI, GEOL SURV, DIST OF COLUMBIA
ION DISTRIBUTION AND WATER MOVEMENT IN SOILS
R. F. MILLER
INT-GS-RMA-1-S
/66- /
INTERIOR-GEOLOGICAL SURVEY

## 10. Energy Conversion (Non-propulsive)

GH 1600 FIELD 7D, 9C, 9A

GLOBE UNION INC, WISCONSIN

A PROGRAM TO DEVELOP A HIGH-ENERGY DENSITY PRIMARY BATTERY WITH A MINIMUM OF 200 WATT HOURS PER POUND OF TOTAL BATTERY WEIGHT
W. E. ELLIOTT, R. W. ADLER, J. R. HUFF
W. L. TOWLE
9/65-12/66
NASA

## 12. Mathematical Sciences

GSM 300 2 FIELD 12A, 5C

STANFORD UNIVERSITY, SCHOOL OF ENGINEERING, INDUSTRIAL ENGINEERING, CALIFORNIA
MATHEMATICAL ASPECTS OF OPERATIONS RESEARCH
G. J. LIEBERMAN, G. •. LIEBERMAN
NSF-GB-3739
11/65-11/66
NSF-MATHEMATICAL SCIENCES DIVISION

GSM 339 2 FIELD 12A

OHIO STATE UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, OHIO
PROBLEMS IN ERGODIC THEORY
R. V. CHACON
NSF-GP-3752
11/65-11/66
NSF-MATHEMATICAL SCIENCES DIVISION

GSM 438 2 FIELD 12A, 9D

UNIVERSITY OF CHICAGO, GRADUATE SCHOOL, STATISTICS, ILLINOIS

MATHEMATICAL STATISTICS
P. MEIER
NSF-GP-3707
11/65-11/66
NSF-MATHEMATICAL SCIENCES DIVISION

GSM 512 1 FIELD 12A

CATHOLIC UNIV OF AMER, GRADUATE SCHOOL, MATHEMATICS, DIST OF COLUMBIA

CHARACTERISTIC FUNCTIONS IN PROBABILITY THEORY
E. LUKACS
NSF-GP-3725
11/65-11/66

NSF-MATHEMATICAL SCIENCES DIVISION

GSM 519 1 FIELD 12A

MICHIGAN STATE UNIV, GRADUATE SCHOOL, MATHEMATICS, MICHIGAN

SECANTS AND TRANSVERSALS IN LINEAR AND PROJECTIVE SPACES
F. HERZOG, L. M. KELLY
NSF-GP-3718
11/65-11/66

NSF-MATHEMATICAL SCIENCES DIVISION

## 13. Mechanical, Industrial, Civil, and Marine Engineering

GR 17 FIELD 10B

UNIV OF CAL-BERKELEY, SCHOOL OF ENVIR DESIGN, ARCHITECTURE, CALIFORNIA
THE DESIGN AND CONSTRUCTION OF LOW-COST SINGLE-FAMILY DWELLINGS FOR GOOD LIVABILITY IN HOT-DRY AREAS
H. SANDOFF
CALIF-LIHO-1
/66- /
HOUSING AND HOME FINANCE AGENCY

GUW 251 FIELD 13B,21D, 7A, 7D

PENNSYLVANIA ST UNIV, SCHOOL OF ENGINEERING, SANITARY ENGINEERING, PENNSYLVANIA
* - SEWAGE OXIDATION - RATES IN NEUTRALIZED* - ACID MINE WATER - STREAM
R. R. KOUNTZ
INT-A-001-PA
7/65- 6/66
INTERIOR-OFFICE OF WATER RESOURCES

GUW 271 FIELD 13G, 8F, 8H, 8G

GEORGIA INST OF TECH, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, GEORGIA

THE EFFECT OF A PERMEABLE BED ON SEDIMENT MOTION
C. S. MARTIN
INT-B-004-GA
/66- /
INTERIOR-OFFICE OF WATER RESOURCES

GYE 110132 1 FIELD 13G,13B,20D

UNIVERSITY OF IDAHO, AGRICULTURAL EXPT STA, AGRIC ENGINEERING, IDAHO
EFFECT OF EXTERNAL AIR PRESSURE ON LIQUID FLOW THROUGH A POROUS MEDIUM
G. L. BLOOMSBURG
AG-IDA-H-512
7/65- 6/66
AGRICULTURE-DEPT OF AGRICULTURE

JJP 1 FIELD 20L,10B

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, MECHANICAL + IND ENGIN, ILLINOIS
INFLUENCE OF LOAD FLUCTUATION ON RADIAL ROLLER BEARING LIFE DURATION
E. I. RADZIMOVSKY, D. W. DAREING
/65- /
JERSEY PRODUCTION RESEARCH COMPANY

JJP 2 FIELD 20L,10B

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, MECHANICAL + IND ENGIN, ILLINOIS
RELATIONSHIP BETWEEN THE MAGNITUDE OF MISALIGNMENT AND ROLLER BEARING LIFE EXPECTANCY
E. I. RADZIMOVSKY, D. W. DAREING
/65- /
JERSEY PRODUCTION RESEARCH COMPANY

JNO 1 FIELD 8H,20D

UNIV OF MINNESOTA, GRADUATE SCHOOL, CIVIL ENGIN + HYDRAUL, MINNESOTA
EFFECTS OF CONDENSER COOLING WATER DISCHARGE FROM PROJECTED ALLEN S. KING GENERATING PLANT ON WATER TEMPERATURES IN LAKE ST. CROIX
C. SILBERMAN, H. STEFAN
7/64- 6/65
NORTHERN STATE POWER COMPANY

JSA 1 FIELD 20L,10B

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, MECHANICAL + IND ENGIN, ILLINOIS
DETERMINATION OF COEFFICIENT OF FRICTION IN INSTRUMENT SPUR GEARS
R. W. ADKINS, E. I. RADZIMOVSKY
/65- /
SANDIA CORPORATION

NIL 132 FIELD 13G,12A,20D

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, ILLINOIS
VARIATION OF TRACTIVE FORCE IN SEWERS AND DRAINS
V. T. CHOW, J. A. REPLOGLE /65- /
ILLINOIS, UNIVERSITY OF

NIL 136 FIELD 13F,20L,20K

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, CIVIL ENGINEERING, ILLINOIS
STUDIES IN HIGHWAY BRIDGES
A. A. ROBINSON, S. BADARUDDIN
C. P. SIESS /65- /
ILLINOIS, UNIVERSITY OF

## 14. Methods and Equipment

NIL 41 FIELD 13B,14E, 5A

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, ENGINEERING, ILLINOIS
ENGINEERING DRAWING FOR PHOTOGRAPHIC REPRODUCTION
R. W. BOKENKAMP
/65- /
ILLINOIS, UNIVERSITY OF

## 17. Navigation, Communications, Detection, and Countermeasures

GSE 725 FIELD 9+, 9A

UNIV OF MINNESOTA, GRADUATE SCHOOL, ELECTRICAL ENGINEERING, MINNESOTA
FIELD EMISSION NOISE
E. R. CHENETTE
NSF-GK-663
10/65- 9/66
NSF-ENGINEERING SCIENCES DIVISION

ZKD 402 1 FIELD 17B, 9C, 9+

US, FED AV AGCY, AV MED SERV, DIST OF COLUMBIA
RADAR AND BEACON VIDEO PROCESSING SYSTEMS - FIELD EVALUATION OF THE RVDP
. NONE
FAA-RD-231-001-01-V
/65- /
FAA-SYSTEMS RES + DEVEL SERVICE

## 20. Physics

GPF 455 4 FIELD 7D, 5A,18A,20H

FLORIDA STATE UNIV, GRADUATE SCHOOL, CHEMISTRY, FLORIDA
AN EXPERIMENTAL STUDY OF NUCLEAR MODELS
R. K. SHELINE, R. *. SHELINE
AT-40-1-2434
8/65- 7/66
AEC-DIVISION OF PHYSICAL RES

GSE 661 FIELD 20D

STANFORD UNIVERSITY, SCHOOL OF ENGINEERING, MECHANICAL ENGINEERING, CALIFORNIA
MASS TRANSFER TO A TURBULENT BOUNDARY LAYER
W. M. KAYS
NSF-GK-534
7/65- 6/66
NSF-ENGINEERING SCIENCES DIVISION

GSM 392 2 FIELD 20H,20C,20I,20J

NEW YORK UNIVERSITY, GRADUATE SCHOOL, MATHEMATICS, NEW YORK
MATHEMATICAL PROBLEMS OF ELECTROMAGNETIC THEORY
M. KLINE
NSF-GP-3608
10/65-10/66
NSF-MATHEMATICAL SCIENCES DIVISION

GSP 1266 2 FIELD 3A,20J,20C, 5A

UNIV OF KENTUCKY, GRADUATE SCHOOL, PHYSICS, KENTUCKY
TWO CENTER PROBLEM - H2 -
W. C. DEMARCUS
NSF-GP-2292
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1410 2 FIELD 4A, 5A,18A

FRANKLIN INSTITUTE, PENNSYLVANIA
TIME VARIATIONS OF COSMIC RAY INTENSITY
M. A. POMERANTZ
NSF-GP-2253
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

GSP 1963 1 FIELD 5A,18A,20J

NORTHEASTERN UNIV, GRADUATE SCHOOL, PHYSICS, MASSACHUSETTS
MANY-BODY PROBLEMS IN THE THEORY OF CONDENSED MATTER
M. H. FRIEDMAN
NSF-GP-3706
11/65-11/66
NSF-PHYSICAL SCIENCES DIVISION

NIL 110 FIELD 12A,13M,20H,20L

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, THEORETICAL + AP MECH, ILLINOIS
BERGMANS METHOD IN PLANE ELASTOSTATIC PROBLEMS
M. STIPPES, D. SHADMAN
/65- /
ILLINOIS, UNIVERSITY OF

PW 1010 FIELD 20D

UNIV OF ROCHESTER, NEW YORK
PARTICLE ORIENTATION AS A FLUID PROPERTIES INDEX
N. A. RUKAVINA
9/64- 8/65
SOCIETY SIGMA XI + SC RES SOC AMER

## 21. Propulsion and Fuels

NIL 67 FIELD 20D,10B

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, AERONAUT + ASTRONAUT, ILLINOIS
THRUST MAGNITUDE CONTROL OF A SOLID PROPELLANT ROCKET MOTOR BY INJECTION AT THE THROAT
A. I. ORMSBEE, R. E. GARDNER, R. NUNN
N. ROTT
/65- /
ILLINOIS, UNIVERSITY OF

## 22. Space Technology

GM 1166 2 FIELD 20F

UNIVERSITY OF MICHIGAN, SCHOOL OF ENGINEERING, ELECTRICAL ENGINEERING, MICHIGAN
CONDUCT RESEARCH ON SPACE-PROBE TECHNIQUES FOR POSSIBLE MEASUREMENTS OF ELECTROMAGNETIC PHENOMENA
F. T. HADDOCK
NASA-SI-3-NSG-181
9/64- 8/65
NASA

NIL 5 FIELD 22A,20M,20D,20K

UNIVERSITY OF ILLINOIS, SCHOOL OF ENGINEERING, MECHANICAL + IND ENGIN, ILLINOIS
TRANSIENT THERMAL MODELING OF SPACECRAFTS
B. T. CHAO
/65- /
ILLINOIS, UNIVERSITY OF

# TECHNICAL ABSTRACT BULLETIN

## Field 1-AERONAUTICS

### 1/1. AERODYNAMICS

**AD-628 580 Fld. 1/1**
**CFSTI Prices: HC $30.80 MF $1.50**
*BOEING CO MORTON PA VERTOL DIV*
**STUDY OF TANDEM ROTOR HELICOPTER DYNAMICS FOLLOWING POWER FAILURE AT HIGH SPEED.**
Technical rept.,
by J. M. Davis, J. F. Kannon, P. F. Leone, and H. A. McCafferty. Nov 65, 236p. Rept. no. R-383,
Contract DA-44-177-AMC-239 (T) Task DA-1D121401A14203,
USAAVLABS TR65-72

Unclassified report

Descriptors: (*Helicopters, Performance (Engineering)), Aviation safety, Helicopter engines, Failure (Mechanics), Aerodynamic characteristics, Dynamics, Analysis

The report covers a parametric study of tandem rotor helicopter dynamics following power failure at high speed (200 knots plus). It was concluded that complete loss of power on a high-speed helicopter results in hazardous flight conditions. Installation of auxiliary propulsion and incorporation of high-inertia rotor blades greatly relieve the situation by increasing the time available for the pilot to initiate recovery. Installation of a collective pitch rate limiter and an engine failure warning horn are recommended, to assist the pilot in taking corrective action. Provided collective pitch inputs are limited to safe values, no serious problems arise in the structural design of rotor blades to meet the conditions encountered in recovery from high-speed power failure. Dualization of engines and fuel systems provides an adequate margin of safety against sudden and complete power failure. (Author)

**AD-628 669 Fld. 1/1**
**CFSTI Prices: HC $16.00 MF $1.00**
*KELLETT AIRCRAFT CORP WILLOW GROVE PA*
**DOWNWASH TESTS OF THE DUAL TANDEM DUCTED PROPELLER VTOL RESEARCH AIRCRAFT CONFIGURATIONS TO EVALUATE ENGINE INLETS, PROTECTION DEVICES AND STUDY AERODYNAMIC INTERFERENCE,**
by H. C. Curtis, Jr. 1 Nov 65, 158p. Rept. no. 179T80-12,
Contract NOw-64-0439-f,

Unclassified report

Descriptors: (*Vertical take-off planes, Downwash), (*Aerodynamic configurations, Research planes), Engine air systems components, Flight testing, Drag, Thrust, Propeller blades, Simulation, Interference, Safety devices

A full scale half-model simulation of a dual tandem ducted propeller VTOL aircraft was tested under the severe environment caused by operation simulating vertical flight in close proximity to sand and crushed stone covered terrain. Four engine inlet protection devices were evaluated in this series of tests. A wing-like deflector device was tested in two configurations of different chord lengths. A full inlet screen and a blocked half-screen inlet protection device were also tested. It was found that due to its location in the upflow region, the full screen tended to collect particles and thereby aggravated inlet ingestion. The blocked half-screen and the deflector devices significantly reduced ingestion, but were not sufficiently effective to positively prevent engine damage. Tests over crushed stone caused significantly worse inlet ingestion and airframe damage problems than those experienced over sand. (Author)

**AD-628 875 Fld. 1/1, 1/3**
**CFSTI Prices: HC $3.60 MF $0.50**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**A VERIFICATION OF THE USE OF THE EFFECTIVE VERTICALLY INTEGRATED STANDARD DEVIATION OF THE WIND IN ESTIMATING DISPERSION OF VERTICALLY RISING BALLOONS.**
Environmental research papers,
by George F. Nolan. Nov 65, 31p. Rept. no. AFCRL-ERP-154,AFCRL-65-832
Proj. AF-6665, Task 666506,

Unclassified report

Descriptors: (*Aerodynamics, Balloons), (*Balloons, Aerodynamics), Wind, Flight paths, Ascent trajectories, Statistical analysis, Climatology

Monthly dispersion patterns of vertically rising balloons for various probability levels are computed for the altitude of 90,000 ft by using the effective vertically integrated standard deviation of the wind. These are representative of conditions at the Holloman AFB - White Sands Missile Range complex. The use of this procedure to obtain a reliable measure of dispersion is verified by testing with individually computed ascent trajectories. The importance of considering interlevel correlation coefficients in estimating dispersion is emphasized by the results of this study. The resulting dispersion patterns afford a means of increasing balloon operational efficiency and effectiveness for the cited area by defining the best locations for target flight launchings, and by giving the probable dispersions for flights launched from a fixed site. The findings of this study can also be of assistance in planning balloon operations at other midlatitude locations. (Author)

**AD-628 160** **See Fld. 20/4**

**AD-628 303** **See Fld. 20/4**

**AD-628 539** **See Fld. 20/4**

**AD-628 583** **See Fld. 20/4**

### 1/2. AERONAUTICS

**AD-628 174** **See Fld. 20/11**

**AD-628 600** **See Fld. 20/11**

**AD-628 678** **See Fld. 6/17**

**AD-628 679** **See Fld. 6/17**

**AD-628 680** **See Fld. 6/17**

### 1/3. AIRCRAFT

**AD-628 087 Fld. 1/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*WICHITA STATE UNIV KANS DEPT OF AERONAUTICAL ENGINEERING*
**INVESTIGATION OF THE CONCEPT OF DIRECT FLIGHT CONTROL.**
Aeronautical rept. (Final),
by Andrew Craig. Aug 65, 36p. Rept. no. ar-65-1,
Contract DA-31-124-ARO (D)-231, Proj. DA-20014501B33G
AROD 4837:1

Unclassified report

Descriptors: (*Flight control systems, Automatic pilot), (*Automatic pilots, Adaptive control systems), (*Adaptive control systems, Flight control systems), Flight paths, Mission profiles, Flight simulators, Analog computers, Human engineering

A system which provides direct and independent control of flight path speed, heading, and angle with the horizon was synthesized and evaluated in an analog computer simulation. Performance by subjects whose piloting experience varied from zero flight hours to four thousand flight hours was compared using direct control and conventional control systems. Two primary results were obtained: first, the performance of a subject with no flight experience using direct control was equal or superior to the performance of a subject of 4,000 hours experience using conventional controls, performance being measured in terms of mean square deviation from a proscribed flight path; second, performance improvement varied inversely with pilot experience. The resulting control scheme utilized closed-loop devices with emphasis placed on simplicity and reliability. (Author)

**AD-628 581 Fld. 1/3, 9/5**
**CFSTI Prices: HC $11.60 MF $0.75**
*LTV VOUGHT AERONAUTICS DIV LING-TEMCO-VOUGHT INC DALLAS TEX*
**INVESTIGATION OF CONTACTLESS SWITCHING CONCEPTS FOR APPLICATION TO AIRCRAFT ELECTRICAL SYSTEMS. VOLUME VI. FLIGHT TEST EVALUATION OF A PROTOTYPE CONTACTLESS SWITCHING SYSTEM.**
Final engineering rept. (phase 6), 15 Aug 64-Jan 66,
by A. J. Marek. 15 Jan 66, 108p. Rept. no. 2-53727/6R449-6,
Contract N600 (19)62121,

Unclassified report

Descriptors: (*Switching circuits, Aircraft equipment), (*Aircraft equipment, Switching circuits), (*Flight testing, Switching circuits), Military requirements, Electrical equipment, Naval aircraft, Jet fighters

A program was conducted which included the design, fabrication, installation and flight testing of a prototype 'Contactless Switching' system with a capability of controlling a limited number of electrical circuits in an F-8 type airplane. Prototype hardware and the system package were operationally checked in the laboratory, and an operational performance record of the flight evaluation was maintained. 'Proposed' Military Standard Specifications were prepared for hardware comprising the 'Contactless Switching System'. (Author)

**AD-628 446** **See Fld. 11/8**

**AD-628 579** **See Fld. 20/4**

**AD-628 668** **See Fld. 11/4**

**AD-628 675** **See Fld. 11/9**

**AD-628 681** **See Fld. 11/9**

**AD-628 831** **See Fld. 13/10**

**AD-628 875** **See Fld. 1/1**

### 1/5. AIR FACILITIES

**AD-628 140** **See Fld. 13/2**

**AD-628 286** **See Fld. 13/2**

**AD-628 290** **See Fld. 13/2**

**AD-628 357** **See Fld. 13/2**

**AD-628 359** **See Fld. 13/2**

**AD-628 501** **See Fld. 13/2**



211-792 O-66-1

AD-628 692 See Fld. 13/2

AD-628 837 See Fld. 13/2

# Field 2-AGRICULTURE

## 2/1. AGRICULTURAL CHEMISTRY

AD-628 294 See Fld. 6/6

AD-628 848 See Fld. 6/6

## 2/3. AGRICULTURAL ENGINEERING

AD-628 530 See Fld. 8/6

# Field 3-ASTRONOMY AND ASTROPHYSICS

## 3/1. ASTRONOMY

**AD-628 534 Fld. 3/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**SOME NEW DATA ABOUT THE INVISIBLE SIDE OF THE MOON,**
by Yu. N. Lipskii. 4 Feb 66, 6p. Rept. no. I-8944,
TT 66-60629

Unclassified report

Novye Dannye o Nevidimoi Storone Luny, trans. from Pravda, Moscow (USSR) 17 Aug 1965.

Descriptors: (*Moon, Astronomical data), (*Lunar probes, USSR), Satellites (Artificial), Television cameras, Photographic techniques, Telemeter data, Astronomy

**AD-628 792 Fld. 3/1**
**CFSTI Prices: HC $8.30 MF $2.25**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**BIBLIOGRAPHY OF LUNAR AND PLANETARY RESEARCH-1960-1964.**
Special rept.,
by J. W. Salisbury. Jan 66, 530p. Rept. no. AFCRL-SR-40 ,AFCRL-66-52
Proj. AF-8602, Task 860203,

Unclassified report

Descriptors: (*Astronomy, Bibliographies), (*Space probes, Bibliographies), Space biology, Comets, Meteors, Meteorites, Moon, Solar systems, Planets

A bibliography of lunar and planetary research articles published during the time period 1960-1964 is presented with both subject and author listings. The major subject categories are: astrobiology, comets, meteorite craters and cratering effects, meteors and meteorites, the moon, origin of the solar system, the planets, and tektites. Each article is abstracted. (Author)

**AD-628 800 Fld. 3/1**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**THE LUNAR CRATER DIONYSIUS.**
Environmental research papers,
by Vern G. Smalley. 17 May 65, 10p. Rept. no. AFCRL-ERP-158,AFCRL-65-853
Proj. AF-8602, Task 860201,

Unclassified report

*Availability: Published in ICARUS v4 n4 p433-36 Sep 1965. Copies to DDC users only.*

Descriptors: (*Moon, Terrain), Astronomical data, Photographic analysis, Optical properties

The lunar crater Dionysius, unlike Tycho, has a white halo with dark rays. A photographic study of this feature revealed many details of the ray pattern, but provided insufficient data to relate the origin of Dionysius to the origin of either the common white-rayed craters or the small dark-haloed craters. (Author)

## 3/2. ASTROPHYSICS

**AD-628 197 Fld. 3/2**
**CFSTI Prices: HC $1.60 MF $0.50**
*ARECIBO IONOSPHERIC OBSERVATORY PUERTO RICO*
**LUNAR RADAR REFLECTIONS,**
by G. Pettengill. 1965, 16p. Contract AF 49 (638)-1156,
AFOSR 65-2269

Unclassified report

Prepared for presentation at the NATO Advanced Study Inst. of the National Observatory of Athens, Cape Sounion, 2-15 Aug 64.

Descriptors: (*Radio astronomy, Moon), (*Moon, Radar reflections), (*Radar reflections, Moon), Extraterrestrial topography, Radar echo areas

The radar cross section of the moon has been measured over a frequency range of about 10 octaves, stretching from 7.84 m to 8.6 mm. Within the accuracy of measurement, which in only a few cases exceeds a factor of 2, there is no significant frequency dependence. The mean of all measurements yields a value of 0.07 of the geometrical (disk) cross section. The angular scattering law has also been determined over a wide range of frequencies, although the best measurements appear to lie in the region from 70 to 0.86 cm. There is a marked frequency dependence both in the mean surface slopes and in the fraction of surface which appears to scatter roughly. At the longer wavelengths the mean surface slope is about 1 in 7, while in the millimeter region the corresponding value approaches 1 in 2. The division of power between the quasi-specular peak corresponding to normal reflection from large smooth areas and the largely nondirectional scattering from rough areas varies from 4 to 1 (favoring quasi-specular) at 68 cm to 1 to 6 (favoring rough) at 0.86 cm. The measurements described above may be used to deduce a surface dielectric constant of about 3. For most likely surface materials this requires a bulk density of about one-half that of siliceous rocks typical of the earth's surface. This value is larger than that deduced for the visible lunar surface and undoubtedly corresponds to conditions a few meters below. (Author)

**AD-628 459 Fld. 3/2, 20/8**
*CALIFORNIA INST OF TECH PASADENA*
**NEUTRON STARS. I. PROPERTIES AT ABSOLUTE ZERO TEMPERATURE,**
by John N. Bahcall, and Richard A. Wolf. 19 Jul 65, 8p. Contract Nonr-220 (47) ,NGR-05-002-028

Unclassified report

*Availability: Published in The Physical Review, v140 n5B pB1445-51 Dec 6 1965. Copies to DDC users only.*

Descriptors: (*Stars, Neutrons), (*Thermal properties, Stars), Cosmic rays, Sources, Astrophysics, Equations of state, Specific heat, Nuclear models, Elementary particles

The properties of a neutron star at absolute zero temperature are discussed. The problem of determining the ground state of a neutron star is formulated in a general way and the conditions are described under which one might reasonably hope that an individual-particle model is valid. The effects of the strong interactions on the number densities and production thresholds of the various hadrons are illustrated with several examples. The modification of the energy spectrum of neutrons and protons in a neutron star is calculated using an effectivemass approximation adapted from the theory of nuclear matter. Crude estimates are made of the contributions of hadrons other than nucleons to the equation of state and specific heat. (Author)

**AD-628 460 Fld. 3/2, 20/8**
*CALIFORNIA INST OF TECH PASADENA*
**NEUTRON STARS. II. NEUTRINO-COOLING AND OBSERVABILITY,**
by John N. Bahcall, and Richard A. Wolf. 19 Jul 65, 16p. Contract Nonr-220 (47) ,NGR-05-002-028

Unclassified report

*Availability: Published in The Physical Review, v140 n5B pB1452-66 Dec 6 1965. Copies to DDC users only.*

Descriptors: (*Stars, Neutrons), (*Neutrinos, Neutron reactions), (*Cooling, Stars), Cosmic rays, Sources, Pions, Meson reactions

Calculations of the rates of the cooling reactions n+n to n+p (-)+ neutrino and n+pion (-) to n+e (-) + neutrino are presented: the rates of the closely related muonproducing reactions and the four inverse processes are also given. Several different arguments are used to obtain estimates of the relevant matrix elements. The nucleons are assumed to form a normal Fermi fluid with a continuous excitation spectrum. The calculated cooling rates indicate that a neutron star containing quasifree pions would cool within a few days to a temperature so low that the star would be unobservable. The surface of a star that does not contain quasifree pions would cool to 10 to the 7th power deg. K in a few months and would reach 4,000,000 deg K in about 100 years. The calculated cooling rates strongly indicate that the discrete x-ray wources located in the direction of the galactic center are not neutron stars. (Author)

**AD-628 475 Fld. 3/2**
*CALIFORNIA INST OF TECH PASADENA*
**ON THE INTERACTION OF RADIATION FROM DISTANT SOURCES WITH THE INTERVENING MEDIUM,**
by John N. Bahcall, and E. E. Salpeter. 27 Sep 65, 6p. Contract Nonr-220 (47) ,NGR-05-002-028

Unclassified report

Prepared in cooperation with Cornell Univ., Ithaca, N. Y. Center for Radiophysics and Space Research.

*Availability: Published in The Astrophysical Journal v142 n4 p1677-81 Nov 15 1965. Copies to DDC users only.*

Descriptors: (*Interstellar matter, Absorption spectrum), Galaxies, Stars, Doppler effect, Photons, Scattering, Astrophysics

Several ways are discussed that a distant radiation source (with a large redshift assumed due to the cosmological expansion) can provide information over a wide range of distances about the intervening medium. Neutral hydrogen (or other atoms) at various distances between the source and receiver will give rise to an 'absorption trough' in the continuous spectrum of a distant source. If the neutral hydrogen is instead concentrated in clusters of galaxies, this trough is replaced by a number of sharp absorption lines. Also discussed are: (i) absorption troughs, (ii) absorption lines from clusters, (iii) photon scattering by free electrons in the intervening medium and (iv) spreading of a radio beam die to inhomogeneities in the ionized gas that is traversed.

**AD-628 557 Fld. 3/2, 20/6**
**CFSTI Prices: HC $8.60 MF $0.75**
*MANCHESTER UNIV (ENGLAND) DEPT OF ASTRONOMY*
**THREE COLOUR PHOTOELECTRIC PHOTOMETRY OF THE MOON.**

Interim scientific rept. no. 1,
by G. L. Roberts. Jul 65, 82p. Contract AF 61 (052)-882,
AFCRL 66-14

Unclassified report

Descriptors: (*Moon, Luminescence), (*Photoelectric effect, Photometers), (*Photometers, Photoelectric effect), Extraterrestrial topography, Meteorites, Optical properties, Correlation techniques, Astrophysics

This report describes experiments attempting to measure the time variation of the luminescence of the lunar surface material, assuming a luminescence band for the surface material similar to that stimulated in certain meteorite samples in the laboratory. The two instruments used are described briefly and a discussion of the results obtained, both in the laboratory and at the telescope, is given. (Author)

**AD-628 565 Fld. 3/2**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**TENUOUS SURFACE LAYER ON THE MOON: EVIDENCE DERIVED FROM RADAR OBSERVATIONS,**
by Tor Hagfors, Richard A. Brockelman, Haines H. Danforth, Leonard B. Hanson, and Gerald M. Hyde. 27 Jul 65, 5p. Rept. no. JA-2627,
Contract AF 19 (628)-5167,
ESD TDR-66-16

Unclassified report

*Availability: Published in Science v150 n3700 p1153-6 26 Nov 1965. Copies to DDC users only.*

Descriptors: (*Moon, Radar scanning), (*Radar scanning, Moon), (*Radio astronomy, Moon), Radar pulses, Backscattering, Radar echo areas, Astrophysics

By radar backscattering, observations of the moon have been made which show a systematic difference between the backscattering coefficient of waves polarized in, and perpendicular to, the local plane of incidence. The results are in agreement with a model consisting of a tenuous top layer at least 10 centimeters thick, supported by a denser underlying layer. (Author)

**AD-628 761 Fld. 3/2, 18/4**
**CFSTI Prices: HC $26.10 MF $1.50**
*KIRUNA GEOPHYSICAL OBSERVATORY (SWEDEN)*
**BALLOON-BORNE MEASUREMENTS OF SOLAR IONIZING RADIATION.**
Final rept., 1 Jul 62-30 Jun 65,
by Willi Riedler. 31 Oct 65, 265p. Contract AF 61 (052)-604,
AFCRL 66-34

Unclassified report

See also AD-610 253.

Descriptors: (*Solar radiation, Radiation measurement systems), (*Radiation measurement systems, Balloons), (*Balloons, Radiation measurement systems), Airborne, Geiger counters, Cosmic ray telescopes, Scintillation counters, Photometers, X rays, Charged particles, Measurement, Geophysics, Test facilities, Sweden

A total number of 127 balloon flights is described, performed in the period July 1962 to June 1965 in the northern auroral zone. Instruments used were GM-tube single counters and telescopes, ionization chambers and scintillation counters. The recorded data are presented in graphical form. Some scientific results are shortly discussed. The work has been performed as a cooperation program between Kiruna Geophysical Observatory, Kiruna, Sweden, Max-Planck-Institut fur Aeronamie, Lindau, Germany, and Laboratoire de Physique Cosmique, Meudon, France. (Author)

**AD-628 813 Fld. 3/2**
**CFSTI Prices: HC $2.60 MF $0.50**
*LIEGE UNIV (BELGIUM) DEPT OF ASTROPHYSICS*
**THE LAMBDA 4300 BAND OF CH IN THE SPECTRUM OF COMET IKEYA (1963A).**
Technical note,
by C. Arpigny. 5 Nov 65, 22p. Rept. no. TN-9,
Contract AF 61 (052)-587,
AFCRL 66-111

Unclassified report

Descriptors: (*Comets, Molecular spectroscopy), (*Hydrocarbons, Molecular spectroscopy), Molecular rotation, Band spectrum, Fluorescene, Molecular energy levels, Belgium

The intensities of the individual rotational lines of the A-delta - X-sq pi (0,0) band of CH have been computed by solving the steady-state equations which describes the fluorescence of CH in comets. These intensities are entered in a computer program for producing theoretical profiles which are then compared with the profile observed in the spectrum of Comet Ikeya (1963a). As in the case of CN it is possible to reproduce the observed intensity distribution when the effects of the Fraunhofer lines are properly taken into account. In order to show this the correct intensity factors appropriate to the A-delta - X sq pi transition of CH have been calculated and are given explicity. The pure rotation transition probability for the transition from K = 2 to K = 1 is found to be about 0.01/sec. (Author)

**AD-628 814 Fld. 3/2**
**CFSTI Prices: HC $2.60 MF $0.50**
*LIEGE UNIV (BELGIUM) DEPT OF ASTROPHYSICS*
**THE ROTATIONAL AND VIBRATIONAL 'TEMPERATURES' OF C2 IN COMETS.**
Technical note,
by C. Arpigny. 5 Nov 65, 23p. Rept. no. TN-10,
Contract AF 61 (052)-587,
AFCRL 66-112

Unclassified report

Descriptors: (*Comets, Spectroscopy), Astrophysics, Carbon, Optical properties, Astronomical observatories, Belgium

Determination of the rotational and vibrational temperatures of C2 in comets on the basis of high-resolution spectrograms. (Author)

**AD-628 828 Fld. 3/2**
*CALIFORNIA UNIV LOS ANGELES*
**SOME PROBLEMS OF PLANETARY NEBULAE,**
by L. H. Aller. 17 Mar 64, 22p. Contract AF-AFOSR-83-65,
AFOSR 65-2802

Unclassified report

Published as UCLA Astronomical Papers v4 n2.

*Availability: Published in Astrophysica Norvegica v9 p293311 Nov 1964. Copies to DDC users only.*

Descriptors: (*Nebulae, Spectroscopy), Celestrial mechanics, Chemical analysis, Astrophysics, Astronomical data

Chief emphasis will be on the spectroscopic problems.

**AD-628 832 Fld. 3/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*AERONAUTICAL CHART AND INFORMATION CENTER ST LOUIS MO*
**LUNAR RELIEF MODELS,**
by C. J. Picariello. Feb 63, 48p. Rept. no. ACIC-Ref-Pub-18,

Unclassified report

Descriptors: (*Moon, Terrain models), (*Terrain models, Moon), Mapping, Simulation, Photography, Planets, Spheres

Describes procedures used to prepare lunar terrain models incorporating spherical curvature and specialized finishing effects. No all-purpose solution to userrequirements is intended but the variety of material possible from lunar model reproduction can furnish a wide range of simulated products. Major objectives resolved as a result of project activity include: development and preparation of prototype easels and curvature bases; master relief models realistically depicting portions of the moon's visible surface; and photomechanical procedures effecting transformation of standard chart projections to true globular projection (required when incorporating scaled lunar curvature). Limited investigation also revealed that a high degree of photosimulation is possible through combined used of controlled lighting, photography, and lunar relief models. Sample shots simulating telescopic observations and predicted or actual orbital views have been included, indicative of materials useful to planning, training, and briefing. (Author)

**AD-628 056 See Fld. 20/14**

**AD-628 089 See Fld. 7/4**

**AD-628 525 See Fld. 20/4**

**AD-628 817 See Fld. 4/1**

## 3/3. CELESTIAL MECHANICS

**AD-628 218 Fld. 3/3**
**CFSTI Prices: HC $2.60 MF $0.50**
*NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF*
**SUPPOSE WE COLLIDE WITH A PLANETOID,**
by C. Sharp Cook. 9 Dec 65, 27p. Rept. no. USNRDL-TR-961,
Proj. SR-011-01-01, Task 0401,

Unclassified report

Descriptors: (*Celestial mechanics, Asteroids), (*Asteroids, Celestial mechanics), Kinetic energy, Meteorites, Impact shock, Earth (Planet), Theory, Astrophysics, Intercept trajectories

A calculation has been made of the kinetic energy that a small planetoid, suh as Icarus, would have if it were attracted by the gravitational field of the earth in such a way that it fell onto the earth's surface. This energy is several orders of magnitude larger than the ey 8uleased by the largest nuclear device exploded to date and is even more than 100 times the average annual energy released by earthquakes. Suggestions and comments are presented regarding possible procedures that might be followed should a collision course appear imminent between such a planetoid and the earth. (Author)

**AD-628 801 Fld. 3/3**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**COMPUTER SOLUTIONS OF THE FORCED PHYSICAL LIBRATIONS OF THE MOON.**
Environmental research papers,
by Donald H. Eckhardt. 10 Feb 65, 12p. Rept. no. AFCRL-ERP-161,AFCRL-65-892
Proj. AF-8654, Task 865401,

Unclassified report

*Availability: Published in Astronomical Journal v70 n7 p466-71 Sep 65. Copies to DDC users only.*

Descriptors: (*Moon, Celestial mechanics), (*Celestial mechanics, Moon), Equations of motion, Astronomical data, Data processing systems, Digital computers

Integration of the differential equations of lunar physical libration theory is facilitated by having a digital computer perform the pertinent numerical algorithms. For various combinations of the lunar moment of inertia ratios, the perturbations to Cassini's laws are calculated accurate to one tenth of an arc second. (Author)

AD-628 208 See Fld. 22/3

# Field 4-ATMOSPHERIC SCIENCES

## 4/1. ATMOSPHERIC PHYSICS

**AD-628 084 Fld. 4/1, 20/14**
**CFSTI Prices: HC $3.00 MF $0.50**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB*
**THE MEASUREMENT OF PHASE AND AMPLITUDE RADIO WAVE INTERACTION AT UNIVERSITY PARK, PENNSYLVANIA, JULY-AUGUST-SEPTEMBER, 1965,**
by A. J. Ferraro, and H. S. Lee. 12 Jan 66, 55p. Rept. no. Scientific-261,
Contract AF19 (628)-4014,NSF-GP-846 Proj. AF-8605, Task 860502,
AFCRL 66-19

Unclassified report

Descriptors: (*Luxemberg effect, Atmospheric sounding), (*Atmospheric sounding, Luxemberg effect), Radio waves, Ionospheric propagation, Electrons, Excitation, Phase measurement, Probes, Ionosphere, Electron density

The objective of the present work is to study the properties of ionospheric D-region using radio wave interaction effect which is also commonly known as Luxembourg effect. The present technique closely follows that developed by Fejer (1955) for radio wave amplitude interaction experiment. However, the technique of measurement as well as the theory of radio wave interaction have been extended and generalized at the Ionosphere Research Laboratory by the introduction of complex coefficient of interaction T, to embody the effect of interaction on both the amplitude and the phase of radio waves.

**AD-628 215 Fld. 4/1, 14/2**
**CFSTI Prices: HC $3.60 MF $0.50**
*UTAH UNIV SALT LAKE CITY UPPER AIR RESEARCH LABS*
**RF PROBE TECHNIQUES FOR IONOSPHERIC MEASUREMENTS.**
Final rept. 1 Jun 64-31 May 65,
by K. D. Baker, A. M. Despain, and J. C. Ulwick. Dec 65, 35p. Contract AF 19 (628)-447, Proj. DASA-5710, Task 7.007,
AFCRL 65-767

Unclassified report

Descriptors: (*Probes (Electromagnetic), Atmospheric sounding), (*Atmospheric sounding, Probes (Electromagnetic)), (*Ionosphere, Probes (Electromagnetic)), Sounding rockets, Rocket antennas, Electrical impedance, Resonance, Plasma physics, Radiofrequency

Three radio frequency (rf) probe techniques - Standing Wave Impedance Probe, Plasma Frequency Probe, and Resonance Rectification Probe - have been simultaneously flown on rockets for ionospheric measurements. The results of the three probes are compared to establish the relationships between them. The Impedance Probe and Plasma Frequency Probe measurements are in general agreement with each other and with other independent measurements. A model of antenna-ionospheric interaction is used which neglects ion sheath and magnetic field effects. The Resonance Rectification Probe shows resonance effects including peaks and minima which are a function of probe dc bias. The frequency of the dominant resonance peak does not correspond to the plasma frequency, but is near a lower frequency of an impedance series resonance as measured by the Plasma Frequency Probe. (Author)

**AD-628 234 Fld. 4/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*UNIVERSITY COLL LONDON (ENGLAND) DEPT OF PHYSICS*
**NIGHT-TIME ELECTRON TEMPERATURES IN THE UPPER F REGION,**
by M. J. Seaton. 30 Nov 65, 5p. Contract N62558-4563,

Unclassified report

Descriptors: (*Ionosphere, Atmospheric temperature), (*Atmospheric sounding, Night sky), (*Night sky, Atmospheric sounding), Electrons, Temperature, Diurnal variations

**AD-628 255 Fld. 4/1, 20/8**
**CFSTI Prices: HC $10.60 MF $0.75**
*ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL*
**DYNAMICS AND STRUCTURE OF THE OUTER RADIATION BELT,**
by C. Y. Fan, P. Meyer, and J. A. Simpson. 1961, 102p. Rept. no. EFINS-61-34,
Contract AF 18 (600)-666,NASw-2
AFOSR 1133

Unclassified report

Descriptors: (*Van Allen radiation belt, Electron density), (*Space environmental conditions, Van Allen radiation belt), (*Electron density, Van Allen radiation belt), Atmospheric sounding, Scientific satellites, Radiation measurement systems, Magnetic storms

From an analysis of electron measurements in the Explorer VI satellite (August 7 - October 6, 1959) four time-dependent parameters have been investigated which characterize the outer electron belt. They are: (1) the equatorial electron intensity, (2) the equatorial range from the earth of the peak intensity, (3) the electron density distribution along a line of force through the intensity peak, and (4) a measure of the change in electron spectrum with time. These parameters along with measurements of magnetic field intensity make it possible to study the origin of the changes in electron intensity and distribution which are known to occur in the outer belt.

**AD-628 272 Fld. 4/1, 20/14**
*ARECIBO IONOSPHERIC OBSERVATORY PUERTO RICO*
**INCOHERENT SCATTER OBSERVATIONS OF TRAVELING IONOSPHERIC DISTURBANCES,**
by George D. Thome. 29 Jun 64, 3p. Contract AF 49 (638)-1156,
AFOSR 65-2813

Unclassified report

*Availability: Published in Journal of Geophysical Research v69 n19 p4047-9 Oct 1 1964. Copies to DDC users only.*

Descriptors: (*Ionospheric disturbances, Atmospheric sounding), (*Atmospheric sounding, Ionospheric disturbances), Radio waves, Scattering, Electron density, Ionosphere, Radio telescopes, Parabolic antennas, Puerto Rico

The incoherent scatter technique is used to study large -scale traveling ionospheric disturbances above Puerto Rico. Below the F-region maximum the measurements of disturbance amplitude, period, and direction of phase progression with time (downward) are consistent with the bottomside results of other workers. Above the maximum, however, the surfaces of constant phase are found to become vertical, disturbance amplitude becomes less, and the periods become greater. (Author)

**AD-628 281 Fld. 4/1, 20/14**
**CFSTI Prices: HC $2.60 MF $0.50**
*NORWEGIAN INST OF COSMIC PHYSICS UNIV OF OSLO*
**ELF AND VLF EMISSIONS IN NORTHERN SCANDINAVIA.**
Scientific summary rept. no. 1,
by Alv Egeland. 20 Aug 65, 25p. Contract AF 61 (052)-811,
AFCRL 66-9

Unclassified report

Descriptors: (*Atmospherics, Norway), Meteorological phenomena, Extremely low frequency, Very low frequency, Electromagnetic waves, Propagation, Radio equipment, Sweden

In this report, the frequencyband of naturally-occurring electromagnetic emissions between DC and 10 kc/s is divided into three sub-bands, namely: The band between DC and, say 6 cps, where the micropulsations are most pronounced, the earth - ionosphere cavity resonance band between 6 and 40 cps, and finally one broad spectrum between 40 cps and 10 kc/s, where both propagation - and emissions phenomena are important. Both the equipment, the method of recording and analyzing, as well as the preliminary results obtained within these three bands are discussed in Sections 2 to 4. Constructionnd building of new receiving equipment (amplifiers, filters, spectrumanalyzers etc) has taken very much data have already been gathered. In Section 5 the research plans for the next year are described. (Author)

**AD-628 334 Fld. 4/1**
**CFSTI Prices: HC $8.60 MF $0.75**
*TECHNICAL UNIV OF DENMARK LYNGBY IONOSPHERE LAB*
**OBSERVATIONS OF WHISTLERS AND VLF EMISSIONS AT GODHAVN AND NARSSARSSUAQ, GREENLAND AND AT TROMSO, NORWAY IN 1963.**
Final technical rept.,
by T. Stockflet Jorgensen, J. Taagholt, and E. Ungstrup. Jul 65, 81p. Rept. no. 19,
Contract AF 61 (052)-735,
AFCRL 66-8

Unclassified report

Descriptors: (*Whistlers, Very low frequency), (*Dawn chorus, Very low frequency), Meteorological phenomena, Atmospherics, Magnetic recording systems, Norway, Greenland

VLF observations recorded during 1963 on magnetic tape at three stations, Godhavn and Narssarssuaq in Greenland and Tromso in Norway, have been treated statistically. The results show that whistlers propagate to Greenland from regions near the east and west coasts of the North American Continent. Good propagation conditions exist from the east coast of North America to Godhavn, 1000 km north of Narssarssuaq. Chorus below 2.0 kc/s occurs at all three stations at nearly the same geomagnetic time. Chorus in higher frequency ranges is observed only very rarely in Godhavn. The observations from Tromso and Narssarssuaq indicate that the time of the diurnal peak increases with latitude for these types of chorus. Earlier observations of correlation between this and other geophysical phenomena have been reconfirmed. (Author)

**AD-628 497 Fld. 4/1**
**CFSTI Prices: HC $12.60 MF $1.00**
*QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS*
**RESEARCH ON PHYSICS OF THE UPPER ATMOSPHERE.**
Annual summary rept.,
by D. R. Bates, A. Dalgarno, B. L. Moiseiwitsch, A. L. Stewart, and A. H. Jarrett. 31 Aug 65, 130p. Contract AF 61 (052)-780,
AFCRL 66-7

Unclassified report

Descriptors: (*Upper atmosphere, Scientific research), (*Atmospheric sounding, Data), Hydrogen, Oxygen, Optical phenomena, Atomic properties

The research is divided as follows: (1) Investigations directly concerned with the upper atmosphere (a) Theoretical studies, (b) Observational studies; (2) Fundamental quantal calculations (a) Collisional processes, (b) Atomic structural problems.

**AD-628 498 Fld. 4/1**
**CFSTI Prices: HC $14.80 MF $1.00**
*QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS*
**RESEARCH ON PHYSICS OF THE UPPER ATMOSPHERE, SUPPLEMENT.**
Suppl. to Annual summary rept.
31 Aug 65, 152p. Contract AF 61 (052)-780,
AFCRL 66-7-Suppl.
Unclassified report

See also AD-628 497.

Descriptors: (*Upper atmosphere, Scientific research), (*Atmospheric sounding, Data), Perturbation theory, Atomic spectroscopy, Helium, Refractive index, Kinetic theory, Atoms, Molecules

**AD-628 602 Fld. 4/1**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J INST FOR EXPLORATORY RESEARCH*
**COMPARISON OF EXPERIMENTAL DATA OF THE EFFECTIVE ION MASS IN THE UPPER IONOSPHERE WITH A THEORETICAL STRUCTURE,**
by P. R. Arendt. 1965, 6p.
Unclassified report

*Availability: Published in Nature v208 n5009 p443-5 Oct 30 1965. Copies to DDC users only.*

Descriptors: (*Ionosphere, Electron density), (*Electron density, Ionosphere), Scientific satellites, Atmospheric sounding, Experimental data, Theory, Correlation techniques

**AD-628 631 Fld. 4/1, 20/8**
*EMMANUEL COLL BOSTON MASS*
**SATELLITE OBSERVATIONS OF LOW-ENERGY PRIMARY COSMIC RAY NUCLEI OF CHARGES Z > OR = 6.**
Physical sciences research papers (Revised ed.),
by Y. K. Lim, and K. Fukui. 29 Jun 65, 10p.
Contract AF 19 (628)-3828, Proj. AF-8600,
Task 860004,
AFCRL 65-900 ,PSRP-181
Unclassified report

Revision of manuscript submitted 1 Jun 65.

*Availability: Published in Journal of Geophysical Research, v70 n19 p4965-7 Oct 1 1965. Copies to DDC users only.*

Descriptors: (*Cosmic rays, Measurement), Scientific satellites, Radiation measurement systems, Atmospheric sounding, Solar radiation

This letter reports the results of a study on low-energy heavy nuclei using emulsions exposed in a recoverable satellite. The stack of emulsions was exposed for 4.1 days under 2.1 g/sq cm of matter in an Air Force satellite (1963-35A) launched on August 29, 1963, into near-polar orbits, and stopping tracks of primary cosmic ray nuclei of charges Z > or = 6 were studied. Charge identification was made by means of delta-ray counting, track area, and photometric track width measurements, and the energy per nucleon was determined from range measurements. (Author)

**AD-628 748 Fld. 4/1**
**CFSTI Prices: HC $1.60 MF $0.50**
*NORWEGIAN INST OF COSMIC PHYSICS UNIV OF OSLO*
**STATISTICS CONCERNING THE APPEARANCE OF ENHANCED VLF-EMISSIONS ON 8 KC/S OBSERVED NEAR THE AURORAL ZONE OVER A TWO-YEAR PERIOD,**
Scientific rept. no. 3, Jun 63-Jun 65,
by L. Harang. 1 Oct 65, 17p. Contract AF 61 (052)-811,
AFCRL 66-10
Unclassified report

Descriptors: (*Atmospherics, Norway), Very low frequency, Ionospheric disturbances, Periodic variations, Electromagnetic waves, Propagation, Polar regions, Aurorae

The results of a two-year period, June 1963 - June 1965, of VLF-emission recordings on 8 kc/s at the Auroral Observatory at Tromso, near the northern auroral zone, is given. The annual curve of appearance of the bursts shows a pronounced variation with a maximum during winter time and a minimum during summer time. In the months November - February VLF-emissions are likely to appear daily for a period of about 1 hour. The diurnal curve shows that the VLF-emissions are limted to appear within the six hours interval 18 - 24 MET. The character of the annual and diurnal curves is explained as due to absorption within the lower part of the ionosphere: the annual absorption effect as due to solar control of the absorption process, the diurnal absorption effect is controlled mainly by the ionospheric absorption due to geomagnetic and auroral disturbances and the after-effects of these. (Author)

**AD-628 767 Fld. 4/1**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**A STUDY OF THE NIGHTTIME IONOSPHERE AND ITS REACTION RATES.**
Physical sciences research papers,
by William Swider,Jr.. Nov 65, 21p. Rept. no. AFCRL-PSRP-166,AFCRL-65-831
Proj. AF-8605, Task 860509,
Unclassified report

Presented at the International Space Science Symposium (5th), Florence, May 12-16, 1964.

*Availability: Published in Journal of Geophysical v70 n19 p4859-75 1 Oct 1965. Copies to DDC users only.*

Descriptors: (*Night sky, Reaction kinetics), (*Ionosphere, Night sky), Dissociation, Recombination reactions, Gas ionization, Geophysics

The purpose of this paper is to deduce some of the more important ionospheric rates from nighttime ionospheric data. Observations of ionic constitution are relied on most heavily. The uncertainty in the rates obtained is estimated, and the rates are compared with laboratory data. Initial analysis of the problem excludes motions, the effect of which is incorporated in a brief discussion of the probable error of the results. The problem is restricted to heights 300 km. Negative ions and the region below about 90 km are not considered. Anticipating the results, some nighttime production sources of the E region are discussed. The need for such sources are shown to be compatible with a rather orthodox viewpoint of the day and night behavior of the E region.

**AD-628 799 Fld. 4/1**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**NIGHTGLOW 5577 A (OI) LIKE KINETIC TEMPERATURES.**
Environmental research papers,
by G. J. Hernandez, and J. P. Turtle. 27 Apr 65, 13p. Rept. no. AFCRL-ERP-149,AFCRL-65-788
Proj. AF-7661, Task 766101,
Unclassified report

*Availability: Published in Planetary and Space Science v13 p901-4 1965. Copies to DDC users only.*

Descriptors: (*Sky brightness, Atmospheric temperature), (*Atmospheric temperature, Sky brightness), (*Upper atmosphere, Atmospheric temperature), Doppler effect, Spectroscopy, Geophysics, Night sky

Kinetic temperatures derived from the Doppler width of the airglow 5577A (OI) line measured with a Fabry -Perot interferometer at Bedford, Massachusetts are reported. The temperatures range from about 150 to 260K, with a mean of 210K. All the measurements were taken at zenith. (Author)

**AD-628 817 Fld. 4/1, 3/2**
**CFSTI Prices: HC $4.60 MF $0.50**
*KIRUNA GEOPHYSICAL OBSERVATORY (SWEDEN)*
**A STUDY OF SOME PROPERTIES OF DIFFRACTION PATTERNS PRODUCED BY RADIO WAVES FROM ARTIFICIAL SATELLITES.**
Scientific rept.,
by Carl-Gustav Johansson, and Ludwik Liszka.
25 Nov 65, 45p. Rept. no. Scientific-10,
Contract AF 61 (052)-678,
AFCRL 66-125
Unclassified report

Descriptors: (*Satellites (Artificial), Radio waves), (*Extraterrestrial radio waves, Atmospheric refraction), (*Radio waves, Atmospheric refraction), (*Atmospheric refraction, Radio waves), Ionospheric propagation, Sweden

The orientation of the line of maximum within the diffraction patterns produced by satellite signals is studied. The observed spread of orientation is explained by variations of orientation and elongation of irregularities; in case of unusually large spread by assuming a quasi-isometric diffraction pattern. A criterion is given, showing whether the distribution of time delays between similar features observed by a pair of aerials may be interpreted in terms of the height distribution of irregularities. (Author)

**AD-628 874 Fld. 4/1, 20/6**
**CFSTI Prices: HC $7.00 MF $1.75**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**TABLES RELATED TO LIGHT SCATTERING IN A TURBID ATMOSPHERE. VOLUME I.**
Special repts.,
by E. deBary, B. Braun, and K. Bullrich. Sep 65, 363p. Rept. no. AFCRL-SP-33,AFCRL-65-710-Vol-1
Contract AF 61 (052)-595, Proj. AF-7621, Task 762103,
Unclassified report

Descriptors: (*Optics, Atmosphere), (*Atmosphere, Optics), (*Light, Scattering), Sky brightness, Polarization, Aerosols, Atmospheric refraction, Tables

The tables present the results of computations of the intensity and the degree of polarization of sky radiation and radiation scattered by a unit volume of air containing natural aerosols. The tabulated data are based upon new values of the scattering functions i sub 1 and i sub 2 and the scattering cross sections k, derived using the Mie theory with m = 1.5. In the case of primary scattering of radiation, the results are valid for a turbid atmosphere. The tables of the scattering coefficients and optical thickness, the absolute scattering functions, the intensities, and the degrees of polarization are computed for various wavelengths between 0.4 and 1.2 microns and for discrete scattering angles between 0 and 180 degrees. Aerosol size distributions of the form dn (r) = c.r/v dlogr, with v = 2.5, 3.0, and 4.0, are assumed. The lower and upper limits for the size range were chosen as r sub 1 = 0.04, 0.06, and 0.08 micron and r sub 2 = 3,5, and 0 microns respectively. (Author)

**AD-628 056** See Fld. 20/14

**AD-628 059** See Fld. 7/4

**AD-628 222** See Fld. 20/14

**AD-628 308** See Fld. 4/2

**AD-628 598** See Fld. 4/2

**AD-628 603** See Fld. 20/14

**AD-628 658** See Fld. 7/4

**AD-628 772** See Fld. 20/14

**AD-628 802** See Fld. 22/2

**AD-628 809** See Fld. 20/14

## 4/2. METEOROLOGY

**AD-628 223 Fld. 4/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*DOUGLAS AIRCRAFT CO INC SANTA MONICA CALIF MISSILE AND SPACE SYSTEMS DIV*
**ON THE EFFECTS OF THE VERTICAL WIND SHEAR; ON THE DEVELOPMENT AND STRUCTURE OF CONVECTION,**
by Chao Jih-Ping, and Cheng Li-Shoo. 1966, 22p. Rept. no. Douglas-Paper-3683,
TT 66-60559

Unclassified report

Trans. of Chi Hsiang Hsueh Pao (Chinese People's Republic) v35 n1 p94-102 Feb 1964.

Descriptors: (*Convection (Heat transfer), Wind), (*Wind, Convection (Heat transfer)), Atmospheric motion, Thermodynamics, Meteorology

In this paper the effects of vertical wind shear on the development and the structure of convection are investigated theoretically. Firstly, from the calculations of perturbation growth rate, the relative importance of the vertical wind shear compared to the unstable stratification is discussed quantitatively. Secondly, the circulation of convection as shown by calculation is similar to that found in thunderstorm and in shower cloud. (Author)

**AD-628 302 Fld. 4/2**
**CFSTI Prices: HC $14.70 MF $1.00**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**TRANSACTIONS OF THE ALL-UNION SCIENTIFIC METEOROLOGICAL CONFERENCE (SELECTED ARTICLES).**
12 Jan 66, 151p. Rept. no. FTD-MT-64-296,
TT 66-60578

Unclassified report

Edited machine trans. of Vsesoiuznoe Nauchnoe Meteorologicheskoe Soveshchanie. Trudy, v7 p3-72, 154-60, 205-15 1963.

Descriptors: (*Meteorology, Symposia), Meteorological parameters, Meteorological phenomena, Scientific research, USSR

The collection includes reports read in the section on Physics of the Surface Layer at the All-Union Scientific Meteorological Conference, conducted in 1961. The collection is devoted to actual questions of the physics of the surface layer, the planetary boundary layer, methods and results of heat-balance investigations, local forecast of turbulent diffusion and others. Results of both theoretical and also experimental investigations are presented. The collection is intended for specialists concerned with the meteorology of lower layers of atmosphere, and also for scientists and engineers of adjacent specialities. (Translator)

**AD-628 308 Fld. 4/2, 4/1**
**CFSTI Prices: HC $1.60 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**MAIN GEOPHYSICAL OBSERVATORY (SELECTED ARTICLES),**
by N. S. Bozhevikov, O. I. Kasatkina, and L. B. Krasilshchikov. 25 Oct 65, 18p. Rept. no. FTD-TT-65-551,
TT 66-60582

Unclassified report

Unedited rough draft trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n153 p11-7, 75-7.

Descriptors: (*Clouds, Height finding), (*Light, Atmospheric refraction), (*Meteorological instruments, USSR), Geophysics, Optics, Atmosphere

**AD-628 456 Fld. 4/2**
*CALIFORNIA UNIV LOS ANGELES DEPT OF ASTRONOMY*
**SPECTROPHOTOMETRIC STUDIES OF GASEOUS NEBULAE. III. THE LOW-EXCITATION RING PLANETARY IC 418,**
by Lawrence H. Aller, and James B. Kaler. 13 May 64, 8p. Contract AF-AFOSR-83-65, AFOSR 65-2806

Unclassified report

*Availability: Published in Astrophysical Journal, v140 p936-41 Oct 1 1964. Copies to DDC users only.*

Descriptors: (*Nebulae, Spectroscopy), Line spectrum, Astrophysics

Plates taken at the coude and prime foci of the Lick 120-inch and at the Mount Wilson 100-inch coude are combined to yield line intensities in the region 31005000 A for the bright, compact, rather regular nebula, IC 418. Line intensities are given both for the bright hydrogen ring and for a strip through the center of the nebula to show the effects of stratification. Average intensities that should approximate those of the integrated light of the nebula are also given. Intensities of emission lines from the central star have been measured and compared with the results of earlier work. (Author)

**AD-628 457 Fld. 4/2**
*CALIFORNIA UNIV LOS ANGELES DEPT OF ASTRONOMY*
**SOME ASPECTS OF THE ABUNDANCE PROBLEM IN PLANETARY NEBULAE,**
by L. H. Aller. 1964, 10p. Contract AF-AFOSR-83-65, AFOSR 65-2807

Unclassified report

*Availability: Published in Publications of the Astronomical Society of the Pacific, v76 n452 p279-88 Oct 1964. Copies to DDC users only.*

Descriptors: (*Nebulae, Spectroscopy), Chemical analysis, Line spectrum, Astrophysics

**AD-628 471 Fld. 4/2**
*LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS*
**THE DISTRIBUTION OF X-RAY SOURCES IN THE GALAXY,**
by Hugh M. Johnson. 10 May 65, 3p.

Unclassified report

*Availability: Published in Astrophysical Journal, v143 n1 p261-3 Jan 1966. Copies to DDC users only.*

Descriptors: (*Galaxies, X rays), (*X rays, Galaxies), (*Cosmic rays, X rays), Astrophysics

**AD-628 598 Fld. 4/2, 4/1**
*CHICAGO UNIV ILL CLOUD PHYSICS LAB*
**TECHNICAL NOTE NO. 32,**
by Roscoe R. Braham Jr., Horace R. Byers, John Rucklidge, Paul Spyers-Duran, and Yoshiaki Toba. 15 Jan 66, 61p. Contract NSF-G22292.

Unclassified report

*Availability: Published in Various reprints. Copies to DDC users only.*

Descriptors: (*Meteorology, Scientific research), Lightning, Thunderstorms, Vapor pressure, Atmospheric condensation, Nucleation, Ice, Crystallography, Rainfall, Sea water, Aerosols

The Relation of Lightning and Thunderstorms to Meteorological Conditions, Vapor Pressure over Solution Droplets, Nucleation in the Atmosphere, The Examination by Electron Microscope of Ice Crystal Nuclei from Cloud Chamber Experiments, An Intense Rainstorm at Fremont, Missouri July 28-29, 1964, On the Giant Sea-salt Particles in the Atmosphere II Theory of the Vertical Distribution in the 10-m Layer over the Ocean.

**AD-628 609 Fld. 4/2**
*SUFFIELD EXPERIMENTAL STATION RALSTON (ALBERTA)*
**A PARTICULATE DIFFUSION EXPERIMENT.**
Technical paper,
by E. R. Walker. 4 Jun 65, 9p. Rept. no. Suffield-TP-309,
Proj. DRB-D52-95-10-28,

Unclassified report

*Availability: Published in Journal of Applied Meteorology, v4 n5 p614-21 Oct 1965. Copies to DDC users only.*

Descriptors: (*Particles, Diffusion), (*Diffusion, Mathematical models), (*Wind, Diffusion), Statistical analysis, Atmospheric motion, Deposition, Statistical distributions

Results are presented from a series of field experiments at Suffield Expeerimental Station. In these experiments, glass spheres were released from a continuous elevated point source above gently rolling prairie terrain. The standard deviations of the distributions of particulate ground deposit across each sampling arc were well forecast, in stationary conditions, by Hay and Pasquill's technique of equating particulate standard deviation with the standard deviations of appropriately sampled and averaged vane angle data. The prediction of the crosswind-integrated deposit and its variation with distance from the emission point appeared to be more difficult because the 'scale' of these field experiments rendered the prediction equations sensitive to the choice of atmospheric diffusion parameters. The predictions of crosswind-integrated deposits were improved if the most appropriate values of the Lagrangian-Eulerian turbulence scale factor were used. (Author)

**AD-628 730 Fld. 4/2, 18/8**
**CFSTI Prices: HC $5.60 MF $0.50**
*TRAVELERS RESEARCH CENTER INC HARTFORD CONN*
**THE INFLUENCE OF LOCAL WINDS ON FALLOUT.**
Rept. no. 2, May-Dec 65, (Final),
by James D. Kangos. Mar 66, 52p. Rept. no. TRC-7465-194,
Contract DA-28-043-AMC-00392 (E), Proj. DA-1V0-14501-B-53A-01,
ECOM 00392-F

Unclassified report

See also AD-620 003.

Descriptors: (*Sea breeze, Radioactive fallout), (*Radioactive fallout, Atmospheric motion), (*Wind, Radioactive fallout), Nuclear explosions, Atmosphere, Transport properties, Atomic clouds, Mathematical prediction, Programming (Computers), Meteorology

Information on the structure of the sea breeze obtained by previous observational and theoretical studies has been employed to develop a kinematic model of the three -dimensional wind field associated with the sea breeze. Existing information on the structure of the stabilized fallout cloud has been used in the numerical computation of the deposition of radioactive particles through a specified sea-breeze circulation. A program was developed for the numerical computation of fallout transport through an analytically prescribed three-dimensional sea-breeze circulation and for the computation of its ground deposition pattern. The computer program was utilized to illustrate the fallout deposition patterns obtainable from simple models of the stabilized cloud through alternative models of three-dimensional sea -breeze wind fields. (Author)

**AD-628 766 Fld. 4/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*EARTH SCIENCES DIV ARMY NATICK LABS MASS*
**A METHOD FOR PREDICTING THE PROBABLE FREQUENCY OF DAILY MINIMUM TEMPERATURES FROM SUMMARIZED DATA.**
Technical rept.,
by Earl E. Lackey. Dec 65, 47p. Rept. no. ES-18,
Unclassified report

Descriptors: (*Atmospheric temperature, Weather forecasting), (*Weather forecasting, Atmospheric temperature), Nomographs, Graphics, Data processing systems, Tables

A method for assessing the relative frequency and level of daily minimum temperatures in various parts of North America in winter months is developed in this paper from the summary 10-year records of 10 widely separated weather stations representative of the numerous variables that are involved in the occurrence of low temperatures. The method is based on the following four items usually found in climatic summaries: (a) absolute minimum temperature; (b) mean daily minimum temperature; (c) mean daily maximum temperature; (d) lengggth of record. The temperature and frequency estimates are achieved by use of a nomographic device with a grid of converted temperature values representing 36 varying degrees of asymmetry of temperature distribution, and a series of predictive curves designating the frequency of occurrence in days per month. The efficiency of the method is demonstrated by tests of internal consistency, also by application to 12 widely separated test stations in the United States, and to 6 'Handbook' stations and by varying length of summary records (10 to 70 years) at a single station, Washington, D. C. (Author)

**AD-628 768 Fld. 4/2**
**CFSTI Prices: HC $15.80 MF $1.00**
*TEXAS A AND M UNIV COLLEGE STATION DEPT OF METEOROLOGY*
**RESEARCH ON TROPICAL RAINFALL PATTERNS AND ASSOCIATED MESO-SCALE SYSTEMS.**
Quarterly progress rept. no. 10, 1 Aug-31 Dec 65,
by Walter K. Henry, John F. Griffiths, L. Glen Cobb, John S. Cornett, and Tommy D. Guest. 4 Jan 66, 162p. Contract DA-36-039-sc-89202, Proj. DA-1VO-14501-B53A-09-04,
Unclassified report

See also AD-623 175.

Descriptors: (*Rainfall, Central America), (*Central America, Rainfall), (*Climatology, Rainfall), Tropical regions, Meteorological parameters, Statistical analysis

The contingency index is used as a tool to show the differences of rainfall and the terrain in Costa Rica. The differences, even with small orographic influences, can be noted. The unusually heavy rain occurring in Panams during 1935 is identified as to period and region. Standard mathematical analytical procedures show that some regions received amounts which may be classified as one in a thousand or one in ten thousand probabilities. The synoptic data pertinent to this period are, unfortunately, not available. The seasonal distribution of precipitation in Honduras is illustrated by means of percentage changes in the monthly rainfall. The general inference from these maps is that changes begin in the south of the country but a few months are characterized by disturbances originating in the north. The daily rainfall observations from San Salvador, El Salvador are examined for independence to determine if they may be approximated by a Markov chain probability model. A tabulation of the marginal and conditional probabilities based on a first order Markov chain are presented and examples are given showing how the probability of occurrence for any sequence of wet and/or dry days may be calculated. (Author)

**AD-628 789 Fld. 4/2**
**CFSTI Prices: HC $19.70 MF $1.25**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**LENINGRAD. MAIN GEOPHYSICAL OBSERVATORY. TRANSACTIONS.**
3 Dec 65, 201p. Rept. no. FTD-MT-64-123, TT 66-60641
Unclassified report

Edited machine trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n143 147p 1963.

Descriptors: (*Weather forecasting, USSR), (*Meteorology, USSR), (*Climatology, USSR), Meteorological parameters, Data processing systems, Geophysics

The collection contains a number of works illustrating numerical methods of analysis and forecasting of weather. In particular, problems in the forecasting of winds, temperatures, and vertical currents, the prediction of pressures in the stratosphere, etc. are examined in detail. The results of investigations of the structure of meteorological fields, applicable to the problem of analysis and forecasting of weather, are outlined. The collection is intended for specialists in the fields of dynamic and synoptic meteorology and in climatology, and for students of advanced courses in the corresponding specialties. (Translator)

**AD-628 820 Fld. 4/2**
**CFSTI Prices: HC $17.80 MF $1.00**
*NORWEGIAN METEOROLOGICAL INST BLINDERN*
**STATISTICAL-DYNAMICAL METEOROLOGICAL PREDICTIONS.**
Final rept.,
by Ragnar Fjortoft. Nov 65, 181p. Contract AF 61 (052)-374,
AFCRL 66-113
Unclassified report

Descriptors: (*Meteorology, Norway), Atmospheric motion, Heating, Meteorological parameters, Statistical analysis, Geophysics, Weather forecasting, Atmosphere models

Contents: Large-scale spectral energy changes in barotropic and baroclinic motions; On the role of differential heating for the maintenance of the long waves; Statistical -dynamical meteorological predictions; Collection and processing of data for the Northern Hemisphere; A study of the predictability of a 28-variable atmospheric model; Significance of regression equations derived from serially correlated data, and a procedure of selecting optimal predictors; On empirical deduction of laws from geophysical records; On the integration of a system of geostrophically balanced prognostic equations; Proceedings of the International Symposium on Numerical Weather Prediction in Tokyo.

**AD-628 200** **See Fld. 20/14**

**AD-628 536** **See Fld. 8/12**

**AD-628 816** **See Fld. 20/14**

**AD-628 842** **See Fld. 8/6**

**AD-628 848** **See Fld. 6/6**

# Field 5-BEHAVIORAL AND SOCIAL SCIENCES

## 5/1. ADMINISTRATION AND MANAGEMENT

**AD-628 058 Fld. 5/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**EVALUATION OF CONTRACTOR'S PERT-TIME ESTIMATING ABILITY.**
Master's thesis,
by Talmadge Augusta Wilson. Aug 65, 96p.
Rept. no. GSM/SM/64-24,
Unclassified report

Descriptors: (*Management control systems, Analysis of variance), Time, Management planning, Decision making, Management engineering

Contractor estimates of activity duration times from a PERT Program Management Network are examined to determine if a trend exists when compared to reporting periods for estimates made prior to and during activities, and if the trend shows an improvement as activity start and completion dates are approached. Only critical activities leading to a major contractual milestone were selected and all network changes eliminated. Regression analysis was applied and revealed that a trend could not be formed for estimates made prior to activity start. The estimates were also compared to the actual duration times to determine if an adjustment could be derived. Regression analysis was again applied and estimating equations computed for each category. The estimating relationships show that adjustments to estimates are possible and further show that the duration times are underestimated a greater percentage of the time.

**AD-628 101 Fld. 5/1, 15/5**
**CFSTI Prices: HC $16.00 MF $1.00**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**DOD PROGRAMMING SYSTEM. AN EXPLANATION AND EVALUATION.**
Master's thesis,
by Stewart De Witt Hawkins. Aug 65, 164p.
Rept. no. GSM/SM/65-5,
Unclassified report

Descriptors: (*Management planning, Department of defense), (*Department of defense, Decision making), Armed forces budgets, Weapon systems, Management engineering, Effectiveness

The DoD Programming System was introduced in 1961-62 by Secretary McNamara to integrate the planning programming budgeting phases of Defense decision-making. This report is an explanation of how the System operates and an evaluation of it, using as a standard basic management principles. This System provides for planning and programming to be conducted on a mission oriented basis and for the overall review of the Services programs. It is a more effective method of Defense

management than was previously used. Current problems with the DoD Programming System however have caused OSD to be pre-occupied with detailed management of short- and mid-range goals to the detriment of long-range planning and general policy guidance. (Author)

**AD-628 257 Fld. 5/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*AIR FORCE ACADEMY COLO*
**AIR FORCE ACADEMY RESEARCH BULLETIN, VOLUME 6.**
Jan 66, 89p.
Unclassified report

Descriptors: (*Air force research, Reviews), Scientific research, Scientific personnel, Abstracts

The report outlines the scholarly activities of the faculty of the United States Air Force Academy from June 1965 through December 1965. The summaries of research projects and accomplishments are arranged alphabetically by investigator and cover first, publications, then research in progress and unpublished manuscripts, and finally, a listing of speeches and seminars. A separate section is devoted to the progress reports of the faculty members who are conducting full-time research studies. Another section covers the activities of the Frank J. Seiler Research Laboratory, Office of Aerospace Research. (Author)

**AD-628 527 Fld. 5/1**
**CFSTI Prices: HC $1.60 MF $0.50**
*AIR FORCE OFFICE OF SCIENTIFIC RESEARCH WASHINGTON D C*
**THE IMPORTANCE OF PROPERLY DESCRIBING THE OBJECTIVES OF THE AFOSR PROGRAM.**
Scientific rept.,
by William J. Price. 19 Nov 65, 19p. Rept. no. AFOSR 66-0191,
Unclassified report

A presentation to the OAR Scientific Advisory Group on 19 November 1965, by William J. Price Executive Director, AFOSR.

Descriptors: (*Air force research, Research program administration), (*Scientific research, Air Force), Air force budgets

The role of fundamental research in a mission-oriented agency is discussed with particular reference to the external contract and grant program of the Air Force Office of Scientific Research. A brief historical account of the evolution of this program points up the tendency to describe the contribution of Air Force research in terms of extreme positions - either in completely missionoriented terms in which all research supported shows clearly its relationship and application to service needs; or completely science-oriented terms which describe the Air Force research roles as primarily a contribution to the large pool of scientific knowledge from which the Air Force and others draw. The point is made that the neglect of either position, and particularly of the role that lies between the extremes, is very unfortunate inasmuch as it results in missing important justification for the research program, and important guidance for the management of the program. The AFOSR is described as a Research Institute - consisting of managers, researchers, and advisors - seeking to help insure the timely impact of science on the Air Force. In carrying out this role it accomplishes research and also it provides communication between the scientific community and the Air Force. The research accomplished is described as phenomena-oriented research which is motivated by either helping a development group obtain the required understanding of phenomena key to technological barriers or by seeking to pioneer or colonize new fields of science holding out high promise for scientific discovery out of which innovations may arise which will bypass current technology barriers. (Author)

**AD-628 747 Fld. 5/1**
**CFSTI Prices: HC $4.00 MF $0.75**
*AIR FORCE OFFICE OF SCIENTIFIC RESEARCH WASHINGTON D C*
**THE FUNDAMENTAL RESEARCH ACTIVITY IN A TECHNOLOGY-DEPENDENT ORGANIZATION,**
by Howard M. Vollmer, Lawrence W. Bass, J. E. Goldman, Floyd Mann, and Donald G. Marquis. 1965, 110p. Rept. no. AFOSR-65-2691,
Unclassified report

Presented at the Institute on Research Administration (10th), held 26-29 April, 1965, Washington, D. C. under the sponsorship of the American University.

Descriptors: (*Scientific research, Air Force), (*Air force research, Management engineering), Research program administration, Scientific personnel

The fundamental research activities of an R and D organization are presented as important both for providing specific research results in areas of potential payoff for the organization and in providing a window between science and technology. The need and potential for the latter activity are inherent in the recognition that a very large portion of the scientific research on which a given technology depends is always done by other organizations. The discussion deals primarily with the opportunities and techniques for providing this window. (Author)

**AD-628 864 Fld. 5/1, 9/3, 9/4**
**CFSTI Prices: HC $6.00 MF $1.25**
*PURDUE UNIV LAFAYETTE IND SCHOOL OF ELECTRICAL ENGINEERING*
**SEMI-ANNUAL RESEARCH SUMMARY (3RD), JULY-DECEMBER 1965,**
1966, 224p.
Unclassified report

See also AD-618 474.

Descriptors: (*Scientific research, Reviews), (*Electronics, Reviews), (*Electrical engineering, Reviews), (*Control systems, Scientific research), Medical research, Control systems, Electric power production, Energy conversion, Electromagnetic fields, Communication theory, Networks, Electron optics, Millimeter waves, Materials

Contents: Medical and life sciences; Control and information systems; Electric power systems and energy conversion; Electromagnetic fields; Electronic systems research laboratory; Communication sciences; Nonlinear circuits and systems; Quantum electronics and millimeter waves; Materials.

**AD-628 405 See Fld. 5/4**

**AD-628 544 See Fld. 5/9**

**AD-628 574 See Fld. 12/2**

## 5/2. DOCUMENTATION AND INFORMATION TECHNOLOGY

**AD-628 183 Fld. 5/2, 5/7**
**CFSTI Prices: HC $6.00 MF $1.25**
*INSTITUT NATIONAL DES TECHNIQUES DE LA DOCUMENTATION PARIS (FRANCE)*
**ON THE THEORETICAL BASIS OF INFORMATION RETRIEVAL SYSTEMS.**
Final rept.,
by Eric de Grolier. Sep 65, 214p. Contract AF 61 (052)-505, Proj. AF-9769, Task 976905, AFOSR 65-2720
Unclassified report

Descriptors: (*Information retrieval, Linguistics), (*Machine translation, Linguistics), (*Linguistics, Information retrieval), (*Semantics, Information retrieval), Language, Documentation, Europe, USSR, United States, State-of-the-art reviews

This report is an extensive survey of and commentary on research and developments in the fields of information retrieval and linguistics and the applicability of results to the formulation of information retrieval languages and machine translation. Commentary is weighted toward imparting an awareness of many of the special requirements of a reasonably efficient IR language, the complexities involved in translating from one language to another (be it natural language, IR language, or other synthetic languages), and the difficulties inherent in describing concepts and representing meanings. Real and putative relations which have been made between logic, linguistics, and information retrieval are explored in some detail. An extensive discussion is included of classification from a theoretical point of view, under topic headings: classifications of language; traditional bibliographic classifications; the British classification research group; Ejnar Wahlin's system; Gardin's Syntol; the problem of categories in classifications; the 'integrative levels' approach; and the problem of 'relations.' Activities in the United States, Europe, and the Soviet Union are considered. (Author)

**AD-628 191 Fld. 5/2**
**CFSTI Prices: HC $3.00 MF $0.50**
*WESTAT RESEARCH ANALYSTS INC DENVER COLO*
**SOME THEORETICAL ASPECTS OF THE IMPROVEMENT OF DOCUMENT SCREENING BY ASSOCIATIVE TRANSFORMATIONS.**
Final rept.,
by Edward C. Bryant, Donald T. Searls, and Robert H. Shumway. 30 Nov 65, 53p. Contract AF 49 (638)-1484, Proj. AF-9769, AFOSR 66-0171
Unclassified report

Descriptors: (*Information retrieval, Subject indexing), (*Subject indexing, Mathematical analysis), (*Search theory, Information retrieval), Documentation, Transformations (Mathematics), Classification, Statistical processes

With respect to document storage and retrieval, one can think of associative techniques as either (1) those which improve the file, or (2) those which improve the search query. The objective of both is to improve the search outcome. In this study, techniques which improve the file have been considered. The file to which they can be applied is one expressible as a matrix of zeros and ones. Two kinds of files have been considered. In the first kind, it is possible to define a 'correct' indexing and in the second kind whether an index term should or should not be selected is partly a matter of opinion. For the first kind of file, mathematical expressions have been found for the amount by which a person can gain by using associative techniques. An experiment was performed on a small Patent Office file to simulate the second situation. Actual indexings of zero or one were replaced by a weighted average of three associative estimates of the relatedness of the term to the document. Retrieval was shown to be improved in the sense that fewer documents had to be examined in order to discover documents which had been judged relevant in previous Patent Office searches. Greater inconsistency of indexing was introduced into the file by randomization and the searching experiment was repeated. Again, the associative techniques proved to be superior. (Author)

**AD-628 206 Fld. 5/2, 5/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*

**HUMAN ENGINEERING THE GPDS/LUCID SYSTEM: CONSIDERATIONS AND PLANS.**
Technical memo.,
by Charles W. Simon. 30 Nov 65, 30p. Rept. no. TM-2776,
Contract AF 19 (628)-5166,
Unclassified report

Descriptors: (*Information retrieval, Display systems), (*Human engineering, Information retrieval), Data processing systems, Data storage systems, Systems engineering, Programming languages

Human engineering considerations and plans for the study and evaluation of the GPDS/LUCID system are discussed. Specific project goals are: (1) to determine how well the current systems match users' needs, and (2) to make recommendations for improving the system where these needs are not met. An ultimate project goal will be to determine human engineering design principles useful for the development of user-oriented, on-line information processing systems in general. Project investigation will examine the GPDS/LUCID systems from the point of view of a user who is essentially unsophisticated in computer programming. (Author)

**AD-628 597 See Fld. 5/9**

**AD-628 776 See Fld. 9/2**

## 5/3. ECONOMICS

**AD-628 095 Fld. 5/3**
**CFSTI Prices: HC $2.60 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**TOWARD FEDERAL PROGRAM BUDGETING,**
by Werner Z. Hirsch. Feb 66, 28p. Rept. no. P-3306,
Unclassified report

Descriptors: (*Federal budgets, Management planning), United States Government, Decision making, Cost effectiveness, Economics, National defense, Sociology, Political science, Law, Defense systems

It is proposed that program budgeting in the Federal government will allow key management functions to be carried out which are not now possible under our present administrative budgeting system; that it can provide formal ways of regularly evaluating alternatives; of stimulating marginal trade-offs among resources; of identifying problem areas; of generating improved management and investment strategies and procedures; of formulating planning and operating theories; and of defining information requirements. In order to make these contributions, program budgeting attempts to make explicit the relationship between direct outputs of programs (patients treated, youngsters educated, missiles produced, etc.) and the nation's more profound objectives and purposes. Some basic concepts of program budgeting are presented, an example of a Federal program budget is developed, applications discussed, and problems and prospects of implementation are examined.

**AD-628 201 Fld. 5/3**
**CFSTI Prices: HC $2.60 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**FULL EMPLOYMENT POLICY AND ECONOMIC GROWTH,**
by Richard R. Nelson. Feb 66, 26p. Rept. no. P-3072-3,
Unclassified report

Descriptors: (*Employment, Economics), (*Economics, Labor), Mathematical models, Mathematical analysis, Money

Within the context of a simple aggregative model, the paper explores how the rate of labor force growth and the rate of technical advance influence the fiscal and monetary policies needed to maintain equality of aggregate demand and potential output. The model attempts to tie together two strands of analysis that have developed in the literature--a neoclassical strand stemming from Solow's work on the determinants of growth of potential output and a neo-Keynesian strand stemming from the Harrod-Domar studies of the conditions under which full employment can be maintained in a growing economy. (Author)

**AD-628 213 Fld. 5/3, 5/4, 9/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**ECONOMIC DEVELOPMENT PLANNING AND INFORMATION SYSTEMS: A DISCUSSION AND BIBLIOGRAPHY,**
by Nake M. Kamrany. 10 Jan 66, 88p. Rept. no. SP-2167,
Unclassified report

Descriptors: (*Economics, Management planning), (*Management planning, Foreign aid), (*Data processing systems, Economics), Computers, Bibliographies

The first part of the report discusses the possible applications of computer based information systems in economics of development planning, with special reference to the underdeveloped countries. The second part provides a selected bibliography of recent literature in economics of development planning, including some relevant literature in computer based modeling techniques and information systems. (Author)

**AD-628 627 Fld. 5/3**
**CFSTI Prices: HC $3.00 MF $0.75**
*RAND CORP SANTA MONICA CALIF*
**HIGHLIGHTS OF THE FIRST TEN YEARS OF THE RAND EMPLOYEES FEDERAL CREDIT UNION (1955-1965),**
by L. W. Green. Jan 66, 58p. Rept. no. P-3307,
Unclassified report

Descriptors: (*Banking, History), Money, Commerce, Personnel, Operation

**AD-628 785 Fld. 5/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*COWLES FOUNDATION FOR RESEARCH IN ECONOMICS YALE UNIV NEW HAVEN CONN*
**MEASURABLE, TRANSFERABLE, COMPARABLE UTILITY AND MONEY,**
by Martin Shubik. 8 Feb 66, 42p. Rept. no. Discussion Paper-200,
Contract Nonr-3055 (00),
Unclassified report

Descriptors: (*Economics, Theory), (*Money, Game theory), (*Bargaining, Game theory), Commerce, Optimization, Probability, Mathematical analysis, Distribution (Economics)

Conclusions: The problems of ordinality, measurability, transferability and the use of money are different but highly related. Ordinality and cardinality concern individual preferences. Cardinality can be obtained from the ordinal properties of preferences either by considering behavior under risk, or by assuming a very special form for the utility functions (this form is related to but different from the assumption of something called money with a constant marginal utility to all). The existence of transferability is equivalent to the Pareto optimal surface being flat in at least some part of the distribution space. The existence of both transferability and comparability calls for the Pareto optimal surface to be flat in both the distribution space and the utility space. The importance of different assumptions concerning measurability and comparability arises when welfare decisions employing criteria of equality or fairness are applied; or when other solution concepts are utilized instead of the competitive market mechanism. Although it is conjectured that flatness in the distribution space is a good approximation in large neighborhood, even if it were false, it is suggested that the investigation of the shape of induced utility functions and the shape of the Pareto optimal surface is an important preliminary to a positive welfare theory.

**AD-628 067 See Fld. 12/2**

**AD-628 172 See Fld. 12/2**

**AD-628 843 See Fld. 8/6**

**AD-628 847 See Fld. 8/6**

## 5/4. HISTORY, LAW AND POLITICAL SCIENCE

**AD-628 405 Fld. 5/4, 9/2, 5/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**SDC DOCUMENTS APPLICABLE TO STATE AND LOCAL GOVERNMENT PROBLEMS.**
Technical memo.,
by Joel M. Kibbee. 3 Jan 66, 21p. Rept. no. TM-2025/000/02,
Unclassified report

Descriptors: (*Political science, Bibliographies), (*Data processing systems, Political science), Urban planning, Law, Public health, Education, Programming (Computers), Management control systems, Information retrieval, Simulation, Computers

The document contains a selective list of SDC publications selected on the basis of their general or specific applicability to current problems of state and local government. Work of a more basic research nature has been omitted. The list is organized by substantive categories and alphabetically by author within each category. The categories include: Public administration, Urban and regional planning, The administration of justice, Bio-medical systems, Educational systems, Computer program systems, The development and management of computer-based systems, Information retrieval, Simulation. AD numbers are provided for those documents which can be obtained from the Defense Documentation Center or the Department of Commerce's Clearinghouse for Federal Scientific and Technical Information. (Author)

**AD-628 484 Fld. 5/4**
**CFSTI Prices: HC $1.10 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**UNITED STATES INTERESTS IN ASIA,**
by Charles Wolf,Jr.. Jan 66, 7p. Rept. no. P-3311,
Unclassified report

Descriptors: (*Asia, Foreign policy), (*United States Government, Foreign policy), Southeast Asia, Government (Foreign), Public opinion, Foreign aid, Economics, Military strategy

An approach to building collaboration and contacts among the Asian countries in order to enhance prospects for achieving a regional balance of power over the longer run, in which the U.S. role and presence would be more modest than it has been. A 'project' approach is suggested that tries to encourage specific projects in which two or more countries of the region collaborate with one another. The numerous and intense international rivalries among countries of the area limit the scope for this approach, and moderation of these disputes should be sought. But there is probably more room for application of a project approach than has been exploited, and further progress along this line may itself ease the rivalries. It would be a reasonable extension of this approach to use U.S. influence and aid programs to encourage multilateral projects in such diverse fields as civic action, defense production, and maintenance services, on the military side, and manpower training, industrial productivity, transportation and telecommunications, on the econom-

ic side. (Text of statement delivered before the House Foreign Affairs Committee, Subcommittee on the Far East and the Pacific, Jan. 27, 1966.)

**AD-628 213** **See Fld. 5/3**

## 5/5. HUMAN FACTORS ENGINEERING

**AD-628 146** **See Fld. 15/2**

**AD-628 206** **See Fld. 5/2**

**AD-628 564** **See Fld. 5/8**

**AD-628 624** **See Fld. 5/10**

## 5/7. LINGUISTICS

**AD-628 108 Fld. 5/7**
*ELECTRONIC SYSTEMS DIV L G HANSCOM FIELD MASS DECISION SCIENCES LAB*
**CONTEXTUAL CORRELATES OF SYNONYMY,**
by Herbert Rubenstein, and John B. Goodenough.
May 65, 8p. Contract SD-187, Proj. AF-2806,
ESD TR-65-218

Unclassified report

*Availability: Published in Communications of the ACM, v8 n10 p627-33 Oct 1965. Copies to DDC users only.*

Descriptors: (*Semantics, Word association), Computational linguistics, Correlation techniques, Decision making

Experimental corroboration was obtained for the hypothesis that the proportion of words common to the contexts of work A and to the contexts of word B is a function of the degree to which A and B are similar in meaning. The tests were carried out for variously defined contexts. The shapes of the functions, however, indicate that similarity of context is reliable as criterion only for detecting paris of words that are very similar in meaning. (Author)

**AD-628 202 Fld. 5/7, 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**THE UNSOLVABILITY OF THE RECOGNITION OF LINEAR CONTEXT-FREE LANGUAGES.**
Scientific rept,
by Shelia A. Greibach. 18 Aug 65, 12p. Rept. no. Scientific-1,
Contract AF 19 (628)-5166, Proj. AF-5632, Task 563205,
AFCRL 65-860

Unclassified report

Prepared in cooperation with Harvard Univ., Cambridge, Mass.

Descriptors: (*Context free grammars, Metamathematics), (*Metamathematics, Context free grammars), Recursive functions, Decision theory, Mathematical logic

The problem of whether a given context-free language is linear is shown to be recursively undecidable. (Author)

**AD-628 183** **See Fld. 5/2**

**AD-628 203** **See Fld. 9/2**

**AD-628 204** **See Fld. 9/2**

**AD-628 815** **See Fld. 5/10**

## 5/8. MAN-MACHINE RELATIONS

**AD-628 494 Fld. 5/8, 9/2, 17/9**
**CFSTI Prices: HC $13.60 MF $1.00**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**BASELINE: A MAN-MACHINE PROGRAM FOR DATA ANALYSIS.**
Technical note,
by G. M. Shannon, H. L. Kasnitz, and J. A. Drumheller. 20 Jan 66, 132p. Rept. no. TN-1966-4,
Contract AF 19 (628)-5167 ,ARPA Order-600
ESD TDR-66-19

Unclassified report

Descriptors: (*Man-machine systems, Radar pulses), (*Radar pulses, Statistical analysis), (*Programming (Computers), Radar pulses), Data processing systems, Oscilloscopes, Real time, Display systems, Graphics, Control, Film readers, Switching circuits

BASELINE was designed to perform a statistical analysis of radar pulse data, previously read by the Laboratory's high precision computer controlled film reader. A computer controlled display oscilloscope, a light pen and a set of function coded sense switches provide a real time interface between an analyst and the data reduction program in the computer. The computer performs all necessary display, computation and outputting functions. All operations are under direct control of the analyst. He sets the operating criteria, exercises the required judgments and steers the program through the required analysis. Analytical results are quickly available and rapidly documented. Output consists of a statistical distribution of the input data displayed on a large oscilloscope. This display may easily be documented photographically. Key parameters describing the statistical distribution may be output on the typewriter at the command of the analyst. A very large saving in data reduction time results since the necessity of repeated test runs through a large computer and subsequent study of the numerical printouts is eliminated. (Author)

**A-628 558 Fld. 5/8, 17/7**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**EXPERIMENTS ON SYSTEMS.**
Meeting speech,
by Douwe B. Yntema, and James L. Morey.
1964, 21p. Rept. no. MS-1240,
Contract AF 19 (628)-5167,
ESD TDR-65-551

Unclassified report

Prepared in cooperation with Mitre Corp., Bedford, Mass.

*Availability: Published in Proc. Information System Sciences Symp., Hot Springs, Va., p349-68 Nov 22-25 1964. Copies to DDC users only.*

Descriptors: (*Systems engineering, Decision making), (*Air traffic control systems, Experimental data), Man-machine systems, Tests, Operations research

The evaluation of computer-based systems for command or control is a technical enterprise that has been underway for scarcely more than a decade. During that time the systems themselves have grown progressively larger, more complex, and apparently more capable. One can raise reasonable doubts, however, that the development of evaluation methodology has kept pace with the development of the systems. As the economic and operational implications of man-computer systems loom larger, the need for more powerful evaluation tools and techniques increases. System testing, as the prime source of data upon which an evaluation is based, shares this need for improved methodology. A system laboratory, when properly equipped and employed, is a powerful tool for developing both improved man-computer systems and improved methods of testing them. This paper attempts to extract some wisdom from the experience gained during four years of such dual-purpose work in a system laboratory. The authors feel current practices can be significantly improved: (a) by conducting system tests as controlled experiments, and, (b) by using a technique that incorporates the judgment of experts into the measurement procedure, so that the composite measures of performance needed for broad evaluation of a system can be achieved.

**AD-628 564 Fld. 5/8, 5/5, 6/4**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**TELLING A COMPUTER HOW TO EVALUATE MULTIDIMENSIONAL SITUATIONS.**
Revised ed.,
by Douwe B. Yntema, and Laura Klen. 1 May 65, 12p. Rept. no. JA-2544,
Contract AF 19 (628)-5167,
ESD TDR-65-557

Unclassified report

Revision of manuscript submitted 1 Dec 64.

*Availability: Published in IEEE Transactions on Human Factors In Electronics vHFE-6 n1 p3-13 Sep 1965. Copies to DDC users only.*

Descriptors: (*Man-machine systems, Decision making), (*Decision making, Man-machine systems), Feasibility studies, Human engineering, Artificial intelligence

If a person could tell a computer exactly how he would evaluate every alternative that might arise, the machine could decide between any two alternatives as the person himself would. A fairly realistic experiment was done to test the feasibility of 'interpolation between corners' as a psychophysical method for telling a machine how to compute the worths of multidimensional alternatives. The results were satisfactory. A statistic called fractional disagreement is proposed as the proper measure of the machine's success in mimicking the man's decisions. The concept of conflict between the dimensions of two alternatives is explained. The size of the conflict and the size of the difference between the worths that the machine ascribed to to the alternatives were found to help to predict the correctness of the machine's decision. Conflict and difference in computed worth should, therefore, be useful in defining regions where the machine should give the decision back to the man and tell him to make the choice. (Author)

**AD-628 141** **See Fld. 6/4**

## 5/9. PERSONNEL SELECTION, TRAINING AND EVALUATION

**AD-628 162 Fld. 5/9, 5/10**
**CFSTI Prices: HC $7.60 MF $0.75**
*HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA*
**THE FEASIBILITY OF DEVELOPING A TASK CLASSIFICATION STRUCTURE FOR ORDERING TRAINING PRINCIPLES AND TRAINING CONTENT.**
Research memo.,
by Donald F. Haggard. Jan 63, 76p.

Unclassified report

Descriptors: (*Behavior, Classification), (*Training, Management engineering), (*Job analysis, Classification), Military training, Feasibility studies, Learning, Systems engineering

The report explores the need for developing a method of systematic analysis, description, and classification of behavioral events as a preliminary step in evolving generalized theoretical formulations and utilizing available knowledge. The theory and methodology of taxonomy are reviewed in relation to the problem of integrating empirical knowledge obtained from discrete behavioral events. Current efforts to construct taxonomic sys-

tems for behavior are examined. An organization of effort is suggested for further development of (1) a theoretical framework for interrelating behavioral research at all levels of generality and (2) a more restricted task classification system for ordering training principles and training content. (Author)

**AD-628 165 Fld. 5/9**
**CFSTI Prices: HC $7.60 MF $0.75**
*HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA*
**ORDNANCE NIKE DETACHMENT ELECTRONICS MAINTENANCE PERSONNEL. ANALYSIS OF ACTIVITIES WITH IMPLICATIONS FOR TRAINING, MAY 1957.**
Staff memo.,
by William E. Montague, and Ralph H. Kolstoe.
1957, 75p.
Unclassified report

Descriptors: (*Maintenance personnel, Job analysis), (*Electronic technicians, Job analysis), (*Military training, Job analysis), Guided missiles (Surface-to -air), Electronic equipment

The objective of the field study was to obtain quantitative information concerning the job activities of enlisted ground guidance electronics maintenancepersonnel in Ordnance Nike Detachments and to relate these third and fourth echelon maintenance activities to the school training the men had received. (Author)

**AD-628 168 Fld. 5/9**
**CFSTI Prices: HC $6.60 MF $0.75**
*HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA*
**THE DEVELOPMENT OF TRAINING PROGRAMS FOR FIRST ENLISTMENT PERSONNEL IN ELECTRONICS MAINTENANCE MOS'S. IV. HOW TO DESIGN TRAINING METHODS AND MATERIALS.**
Research memo.,
by Arthur J. Hoehn. Feb 60, 64p.
Unclassified report

See also AD-632 944.

Descriptors: (*Electronic technicians, Training), (*Training, Maintenance personnel), Learning, Management engineering, Handbooks

The paper consists primarily of a statement of concepts and principles relevant to the design of training methods and materials. This is followed by a brief outline of the procedure for applying the concepts and principles.

**AD-628 207 Fld. 5/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**HETEROGENEOUS KEY DEVELOPMENT: VOCATIONAL INTERESTS OF COMPUTER PROGRAMMERS.**
Technical memo.,
by Dallis K. Perry, and William M. Cannon. 30 Dec 65, 12p. Rept. no. TM-2655/003/00,
Unclassified report

Descriptors: (*Computer personnel, Selection), (*Personnel management, Computer), Programming (Computers), Aptitude tests, Manpower studies

A refined computer programmer interest key was developed for the Strong Vocational Interest Blank and found to be somewhat superior to the earlier keys. The new key is recommended for use, and normative data are provided. (Author)

**AD-628 444 Fld. 5/9, 5/10**
**CFSTI Prices: HC $2.60 MF $0.50**
*HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA*
**THE INFLUENCE OF PRACTICE FRAMES AND VERBAL ABILITY ON PROGRAMED INSTRUCTION PERFORMANCE.**
Technical rept.,
by William H. Melching, and Frank B. Nelson.
Jan 66, 25p. Rept. no. TR-66-1,
Contract DA-44-188-ARO-2, Proj. DA-2J024701A712-01,
Unclassified report

Descriptors: (*Programmed instruction, Learning), (*Verbal behavior, Performance tests), (*Learning, Performance tests), Achievement tests, Analysis of variance, Performance (Human), Counterinsurgency

The effect of special practice frames upon programed instruction performance was examined using a program in counterinsurgency. The individuals who served as subjects represented two levels of verbal ability. Practice frames enabled subjects to proceed through the program at a faster rate per frame, make fewer program errors, and score higher on a recall type of achievement test. Subjects of higher verbal ability were able to proceed through the program at a faster rate, make fewer program errors, and exhibit higher scores on all measures of achievement. (Author)

**AD-628 544 Fld. 5/9, 5/1**
**CFSTI Prices: HC $4.00 MF $1.00**
*ANALYTIC SERVICES INC FALLS CHURCH VA*
**TRANSFERABILITY OF RESEARCH AND DEVELOPMENT SKILLS IN THE AEROSPACE INDUSTRY.**
Final rept.,
by Ronald P. Black, and Charles W. Foreman.
Sep 65, 145p. Rept. no. R-12860,
Contract AF 49 (638)-1259,
Unclassified report

Descriptors: (*Transfer of training, Aeronautics), (*Personnel management, Aeronautics), (*Scientific personnel, Distribution), Scientific research, Labor, Armed forces budgets, Feasibility studies, Research program administration

The report treats the possibility that the aerospace industry could apply its capabilities to the solution of large-scale public problems, thus offsetting any significant reductions in the military budget. It includes discussion of what this action would imply in relation to the transferability of industry scientists and engineers. Studies performed by four aerospace contractors for the State of California are used as case examples of the industry's attempt to transfer some of its R and D skills to civilian and public projects. Conclusions are reached that (1) as indicators of the transferability of industry scientists and engineers, the four California studies are inconclusive; (2) the largest group of scientists and engineers in the industry, those engaged in design and development, may well be the least transferable; and (3) civilian-public projects are unlikely to become in the next 5 years or so a significant part of the industry's business. (Author)

**AD-628 551 Fld. 5/9**
**CFSTI Prices: HC $8.60 MF $0.75**
*PERSONNEL RESEARCH LAB (6570TH) AEROSPACE MEDICAL DIV LACKLAND AFB TEX*
**USAF OFFICER EVALUATION SYSTEM SURVEY: ATTITUDES AND EXPERIENCE,**
by Margorie N. Kaplan, and Ray W. Alvord. Nov 65, 83p. Rept. no. PRL-TR-65-17,
Proj. AF-7719, Task 771904,
Unclassified report

Descriptors: (*Officer personnel, Psychometrics), (*Air force personnel, Psychometrics), (*Personnel management, Attitudes), Public opinion, Statistical analysis

More than 2,200 Air Force officers from 38 bases in 6 commands were intensively surveyed as to their knowledge, attitudes, and opinions about the officer evaluation system. In many areas, significant differences were found between commands, grades, duties, regular/reserve officers, and flying status groups when reactions of these groups were compared to reactions of the total sample. Analysis of the attitudes revealed by the survey indicated that although the majority of officers are satisfied to some extent with procedures now utilized in the evaluation system and the performance ratings they have received, a substantial number seemed to be in favor of a number of changes. By and large, this trend is related to grade-the higher the grade, the greater the satisfaction with the status quo. (Author)

**AD-628 597 Fld. 5/9, 5/2**
**CFSTI Prices: HC $1.60 MF $0.50**
*PERSONNEL RESEARCH LAB (6570TH) AEROSPACE MEDICAL DIV LACKLAND AFB TEX*
**CLASSIFICATION OF INFORMATION TOPICS BY CLUSTERING INTEREST PROFILES,**
by Helen Tomlinson. Nov 65, 18p. Rept. no. PRL-TR-65-19,
Proj. AF-6755 ,AF-7717
Unclassified report

Descriptors: (*Classification, Automatic), (*Personnel management, Data Processing systems), Documentation, Subject indexing, Programming (Computers), Psychometrics

A computer program was applied to cluster indexing terms into field-of-interest categories, defined by responses of staff members of a personnel research laboratory. This provides a practical scheme for document classification. The method clusters successively pairs of topics that have the highest probability of being marked together by the scientist as both being of interest or neither one of interest. Ten fields of interest related to the group mission were identified by this hierarchal grouping. (Author)

**AD-628 701 Fld. 5/9, 12/1, 9/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA*
**A STUDY OF MATHEMATICAL SKILLS REQUIREMENTS FOR BASIC ELECTRONICS IN THE U. S. ARMY AIR DEFENSE SCHOOL.**
Consulting rept.,
by John A. Cox, and Richard C. Montgomery.
Oct 64, 41p.
Unclassified report

Descriptors: (*Military training, Electronics), (*Mathematics, Electronics), (*Electronics, Mathematics), Army personnel, Training

The purpose of this study was to determine the minimum amount of mathematical skill required for successful completion of the Basic Electronics Subcourse presented in the Air Defense School. Mathematical skills were measured by a test prepared by the Air Defense Human Research Unit and by the Lankton First Year Algebra Test. Written tests, practical tests, final grade average, and disposition category were used as school success measures. These measures were collected on from 187 to 243 first-time-entering trainees in Basic Electronics. Statistical analyses were performed on these data to obtain answers for the second and third research problems. Eight written tests from Basic Electronics were analyzed for mathematical content.

**AD-628 753 Fld. 5/9, 5/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF*

**AGE, YEARS OF SCHOOLING, AND INTELLIGENCE AS PREDICTORS OF MILITARY EFFECTIVENESS FOR NAVAL ENLISTEES.**
Interim rept.,
by John A. Plag, and Lawrence E. Hardacre. Jul 65, 44p. Rept. no. 65-19,
NAVMED MF022.01.04-9001
Unclassified report

Descriptors: (*Naval personnel, Selection), (*Naval training, Effectiveness), Psychistry, Psychometrics, Aging (Physiology), Education, Statistical analysis

The validity of age, education, and GCT score in the prediction of four criteria of two-year military effectiveness was examined for a group of 952 enlistees who entered Naval Service in 1960. Subjects were graduated from training without being subjected to routine psychiatric screening procedures. Thus, the findings are applicable as a guide for clinicians at training commands who regularly make decisions concerning the efficacy of service retention for recruits who experience adjustmental difficulties in training. The four criteria of effectiveness were pay grade level, division officer ratings of adjustment, semi-annual marks, and record of disciplinary or commendatory action. Data for the 952 subjects comprising the validation sample were analyzed by multiple correlation procedures. Regression equations were derived for each criterion and cross-validated on another subject group of comparable size. The relations of each of the three predictors with the four criteria were found to be statistically significant and consistent from criterion to criterion. When combined, each of the independent variables contributed uniquely to the multiple correlations, but these were generally of small magnitude, ranging from .26 to .45 for the cross-validation sample. Charts were constructed to facilitate the determination of predicted criterion scores from specific combinations of the age, education, and GCT score variables. (Author)

**AD-628 754 Fld. 5/9, 5/10, 6/5**
*NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF*
**PSYCHIATRIC RE-EXAMINATION OF UNSUITABLE NAVAL RECRUITS: A TWO-YEAR FOLLOW-UP,**
by John A. Plag, and Ransom J. Arthur. 1965, 10p. Rept. no. 65-13,
NAVMED MR005.12-2201-1
Unclassified report

*Availability: Published in The American Journal of Psychiatry v122 n5 p534-41 Nov 1965. Prepared for presentation at the annual meeting of the American Psychiatric Association (121st) New York, N. Y., May 3-7, 1965.Copies to DDC users only.*

Descriptors: (*Adjustment (psychology), Naval personnel), (*Naval personnel, Adjustment (Psychology)), Psychiatry, Naval training, Behavior, Social psychology

In 1960 and 1961, of 216 recruits adjudged unsuitable by aptitude boards at two naval recruit training commands, 134 were deliberately graduated from training in order to assess their adjustment in the fleet. Two years subsequent to graduation, 97 of these sailors were still on active duty in the Navy and their over-all adjustments, evaluated on the basis of psychiatric follow-up examinations, were not demonstrably different from those of a matched control group. It is suggested that the unexpected high rate of fleet retention among enlistees judged to be unsuitable as recruits occurred because (a) many subjects were able to achieve emotional growth and maturity in the supportive and stable environment of the military, despite their pathological backgrounds; (b) the fleet was able to utilize the services of some marginally performing elistees, at least during the first several years of their enlistments; and (c) initial training and adjustment problems were, for some youths, merely transitory. (Author)

**AD-628 869 Fld. 5/9**
**CFSTI Prices: HC $1.60 MF $0.50**
*NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF*
**REENLISTMENT DIFFERENCES AMONG RECRUIT COMPANIES: A FIVE YEAR FOLLOW-UP.**
Research rept. (final),
by David W. Robertson, and Bernard Rimland. Jan 66, 12p. Rept. no. SRR-66-15,
Proj. PF016050303,
Unclassified report

Descriptors: (*Naval personnel, Recruiting), Naval training, Motivation, Statistical tests

The study investigated the possibility that differences in the experiences of recruits of different companies during recruit training might be reflected by significant differences in the recruit's later decision on whether or not to reenlist. Reenlistment percentages of 49 recruit companies convened in February 1960 were computed from the number of these former recruits who had reenlisted by July 1965. A statistical test (chi-square) of the reenlistment percentage differences among companies indicated the differences to be too small to be statistically significant. It was concluded that intercompany variations (such as differences in the effectiveness of company commanders) have little, if any, bearing on later reenlistment. It would therefore seem advisable to direct research efforts toward areas which appear to offer more promise of identifying retention-related factors than those which might be supposed to be operative at the recruit company level. (Author)

**AD-628 690 See Fld. 5/10**

**AD-628 776 See Fld. 9/2**

**AD-628 815 See Fld. 5/10**

## 5/10. PSYCHOLOGY (INDIVIDUAL AND GROUP BEHAVIOR)

**AD-628 109 Fld. 5/10**
*ELECTRONIC SYSTEMS DIV L G HANSCOM FIELD MASS DECISION SCIENCES LAB*
**INFORMATION TRANSMISSION IN A PATTERN DISCRIMINATION TASK AS A FUNCTION OF INITIAL TASK DIFFICULTY,**
by John Coules, Donald L. Avery, and Alan Meskil. 27 Oct 65, 13p. Proj. AF-7682,
ESD TR-65-326
Unclassified report

Prepared in cooperation with Northeastern Univ., Boston, Mass.

*Availability: Published in Perceptual and Motor Skills v21 p927-39 1965. Copies to DDC users only.*

Descriptors: (*Learning, Visual acuity), (*Visual acuity, Geometric forms), Performance tests, Analysis of variance

Information transmission measures were obtained with the method of absolute judgments and learning effects were evaluated as the nature of the discrimination task varied. Two experiments were conducted using regular and irregular geometric forms which were tilted in various degrees from the line of sight. In Exp. I, the judgment task increased in difficulty from large to fine differences in tilt, whereas in Exp. II the discrimination task was difficult throughout the experiment. In both experiments the task increased in difficulty because stimulus uncertainty increased. Results showed that when the demands of the task are such that early and sustained high performance is required, it is better if the observers are presented with the difficult task from the start rather than gradually increase its difficulty. Geometric forms showed significant differences in the amount of information transmitted. (Author)

**AD-628 149 Fld. 5/10**
**CFSTI Prices: HC $1.60 MF $0.50**
*NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AEROSPACE MEDICAL RESEARCH DEPT*
**QUANTITATIVE RELATIONS AMONG MEASURES OF BEHAVIOR UNDER A FIXED-INTERVAL SCHEDULE OF REINFORCEMENT.**
Phase rept.,
by Robert M. Herrick. 6 Dec 65, 14p. Rept. no. NADC-MR-6506,
NAVMED MR005.13-0002.16.16
Unclassified report

Descriptors: (*Behavior, Psychometrics), (*Psychometrics, Mathematical analysis), Correlation techniques, Performance tests

Behavior of subjects under a fixed-interval schedule of reinforcement is often represented in a plot of cumulative responses versus time. Three performance measures were suggested to characterize the behavior represented in such a plot: the index of curvature, the quarter life, and the first half ratio. The paper describes the quantitative relationships among these three measures. (Author)

**AD-628 188 Fld. 5/10**
**CFSTI Prices: HC $3.00 MF $0.75**
*ELECTRONIC SYSTEMS DIV L G HANSCOM FIELD MASS DECISION SCIENCES LAB*
**EFFECT OF INTENSITY CHANGES IN AUXILIARY STIMULI ON AUDITORY AND VISUAL SIGNAL DETECTION,**
by William H. Watkins. Dec 65, 63p. Proj. AF-7682, Task 768201,
ESD TR-66-121
Unclassified report

Descriptors: (*Auditory perception, Psychometrics), (*Visual perception, Psychometrics), Light, Sound signals, Intensity, Analysis of variance

Results of automated tone detection experiments are reported. Subjects were required to identify one of four short intervals as having contained a weak, earphone-presented, auditory signal. These experiments involved approximately 20,000 trails. Each experiment employed at least two lighting conditions. In general, when the light source intensified during the intervals, detection was superior to that occurring when the light diminished at corresponding times. The findings are compared with the results of analogous experiments involving visual signal detection under several conditions of auditory stimulation. Some possible explanations for consistencies in the two kinds of experiments are considered, and individual differences are discussed. (Author)

**AD-628 198 Fld. 5/10, 6/19**
**CFSTI Prices: HC $1.00 MF $6.50**
*AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO*
**HUMAN PERFORMANCE AS A FUNCTION OF CHANGES IN ACOUSTIC NOISE LEVELS.**
Final rept., Jun 64-Feb 65,
by Richard W. Shoenberger, and Charles S. Harris. Dec 65, 20p. Rept. no. AMRL-TR-65-165,
Proj. AF-1710, Task 171002,
Unclassified report

Descriptors: (*Performance (Human), Noise), (*Noise, Performance (Human)), Acoustic properties, Intensity, Analysis of variance, Learning, Psychomotor tests

Psychomotor performance of 16 subjects was evaluated under four noise conditions, during four test sessions, in a Latin square design. Three ex-

perimental conditions each began with different intensities of noise (Quiet, 85 dB, or 95 dB). After 30 minutes exposure the noise was changed to a final high intensity level (110dB), which lasted for 15 minutes. The fourth condition served as a control, in which Quiet prevailed throughout the entire 45 minute period. The results partially supported the hypothesis that greater changes in noise levels produce greater decrements in performance. There was, however, a strong interaction between noise conditions and sessions. The nature of this interaction indicated that this phenomenon does not occur uniformly throughout the course of learning, and probably is of lesser importance for well learned tasks. (Author)

**AD-628 221 Fld. 5/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF PSYCHOLOGY*
**MULTIDIMENSIONAL SCALING AND COGNITION: I. RELATIONS AMONG JUDGEMENTS OBTAINED UNDER VARYING CONDITIONS,**
Technical rept.,
by Norman Cliff. Nov 65, 36p. Rept. no. Tr-1, Contract Nonr-228 (32),
Unclassified report

Descriptors: (*Reasoning, Psychometrics), Analysis of variance, Emotions, Perception (Psychology)

The study was designed to see if the multidimensional scaling solutions for judgements of the same stimuli gathered using different directions and diffrent orders of presenting the stimuli could be considered transformations of the same underlying structure and whether or not unidimensional judgements could be related to the same underlying space. Four groups of S's judged the differentness of all possible pairs of 13 lightfoot faces. The groups differed in the set given them in the directions and in the order in which the pairs were presented. One group received directions instructions to emphasize the pleasantness of the emotions in their judgements, one viewed the stimuli in an order designed to emphasize the pleasantness distinction, the third viewed the stimuli in an order designed to elicit non-Euclidean judgements. A fourth group served as a standard. All four groups judged the intensity of the 13 emotions as well as the differentness of the pairs. The multidimensional spaces derived for the four groups were found to differ only slightly but in some cases the differences appeared to be systematic. In all four groups the judgements of intensity of the emotions were closely related to the multidimensional spaces derived from the differentness judgements. (Author)

**AD-628 226 Fld. 5/10**
*NORTHWESTERN UNIV EVANSTON ILL*
**STUDIES OF CODING IN VERBAL LEARNING,**
by Benton J. Underwood, and Adrienne H. Erlebacher. 17 Jan 65, 27p. Contract Nonr-1228 (15), Proj. NR-154-057,
Unclassified report

Pub. as Psychological Monographs: General and Applied v79 n13, No. 606.

*Availability: American Psychological Association, Inc., 1200 17th St., N. W., Washington, D. C., HC $1.50.*

Descriptors: (*Learning, Word association), (*Verbal behavior, Learning), Recall

Six experiments are reported in which free learning (FL) and paired-associate learning (PAL) were examined with respect to the effects of coding of verbal units on learning. In 2 FL experiments and 1 PAL experiment where response terms were manipulated, encoding of trigrams to words produced a more meaningful unit. Such encoding was shown to influence learning positively only if decoding was simple. Encoding of a stimulus term to a word was also shown to influence learning positively, but such encoding did not occur unless the possibilities were easily perceived. Finally, an experiment demonstrated sound coding of response terms, but the positive effect on transfer was small and limited to unmixed lists. We concluded that coding systems: (a) may influence learning positively if decoding is simple; (b) will produce only a small positive effect even under favorable conditions; (c) may have no positive effect even if used and may, under certain conditions, inhibit learning. (Author)

**AD-628 232 Fld. 5/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*RUTGERS - THE STATE UNIV NEW BRUNSWICK NJ*
**RELATIONSHIP BETWEEN GROUP EQUILIBRIUM, PRODUCTION AND MORALE IN PROBLEM SOLVING WORK GROUPS.**
Annual rept.,
by F. K. Berrien. Nov 65, 7p. Contract Nonr-404 (10)
Unclassified report

Descriptors: (*Group dynamics, Behavior), Problem solving, Culture, Social psychology, Industrial psychology

Studies are reported on the following topics: homeostatic theory of small groups; study of organizational and relevant small group and individual dimensions; trans-cultural studies.

**AD-628 241 Fld. 5/10**
*APPLIED PSYCHOLOGICAL SERVICES WAYNE PA*
**PERSONNEL PSYCHOPHYSICS,**
by Mark G. Pfeiffer, and Arthur I. Siegel. 28 Dec 65, 2p. Contract Nonr-2279 (00)
Unclassified report

*Availability: Published in Perceptual and Motor Skills v22 p257-8 1966. Copies to DDC users only.*

Descriptors: (*Psychophysiology, Personnel), (*Maintenance personnel, Psychometrics), Circuits, Perception (Psychology)

It was hypothesized that the psychophysical law would describe the relationship between perceived circuit complexity as judged by journeymen maintenance personnel and the actual number of complexity attributes of circuits as determined by professional engineers. Employing data independently derived from these two sources, the above hypothesis appears to have been verified. (Author)

**AD-628 243 Fld. 5/10, 6/5**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**CHRONIC ELECTROSHOCK: EFFECTS ON BRAIN WEIGHT, BRAIN CHEMISTRY, AND BEHAVIOR,**
by Gordon T. Pryor, Leon S. Otis, and Edward Uyeno. 1964, 2p. Contract Nonr-2993 (00)
Unclassified report

*Availability: Published in Psychon Sci v4 p85-6 1966. Copies to DDC users only.*

Descriptors: (*Shock therapy, Behavior), (*Brain, Stimulation), (*Convulsive disorders, Learning), Cholinesterase, Acetylcholinesterase, Proteins, Weight, Nervous system, Space perception, Errors, Rats

Minimum or maximum electroshock convulsions administered chronically to rats resulted in increased brain weight, total brain cholinesterase activity, total protein, and total acetylcholinesterase activity depending upon whether or not full convulsions were induced and on the frequency of their induction over a 17-20 week period. Convulsed rats made more errors in an underwater T-maze than rats given subconvulsive shocks or sham controls. (Author)

**AD-628 244 Fld. 5/10**
*AMERICAN INSTITUTES FOR RESEARCH SILVER SPRING MD*
**INTERACTION OF ABILITY AND MOTIVATION IN PERFORMANCE,**
by Edwin A. Locke. 28 Sep 65, 8p. Contract Nonr-4792 (00),
Unclassified report

*Availability: Published in Perceptual and Motor Skills v21 p719-25 1965. Copies to DDC users only.*

Descriptors: (*Motivation, Performance (Human)), (*Performance (Human), Psychometrics), Aptitude tests

Four studies are reported which attempted to replicate previous findings of significant interactions between ability and motivation in performance. In general, the previous findings were not strongly replicated, though there was some evidence that the effects of motivation on High Ability Ss are relatively greater than on Low Ability Ss. However, several significant motivation and ability effects were found for both Low Ability and Low Motivation Ss, respectively. (Author)

**AD-628 260 Fld. 5/10**
*EDUCATIONAL TESTING SERVICE PRINCETON NJ*
**A STRONG TRUE-SCORE THEORY, WITH APPLICATIONS.**
Revised ed.,
by Frederic M. Lord. 7 Aug 64, 34p. Contract Nonr-2752 (00) Proj. NR-151-201,
Unclassified report

Revision of manuscript submitted 20 Jun 64. Prepared in cooperation with Princeton Univ., N. J. Econometric Research Program. Grant NSF-GP-579.

*Availability: Published in Psychometrika, v30 n3 p239-70 Sep 65. Copies to DDCusers only.*

Descriptors: (*Psychometrics, Mathematical models), Distribution, Statistical tests

A 'strong' mathematical model for the relation between observed scores and true scores is developed. This model can be used. (1) To estimate the frequency distribution of observed scores that will result when a given test is lengthened. (2) To equate true scores on two tests by the equipercentile method. (3) To estimate the frequencies in the scatterplot between two parallel (nonparallel) tests of the same psychological trait, using only the information in a (the) marginal distribution (s). (4) To estimate the frequency distribution of a test for a group that has taken only a short form of the test (this is useful for obtaining norms). (5) To estimate the effects of selecting individuals on a fallible measure. (6) To effect matching of groups with respect to true score when only a fallible measure is available. (7) To investigate whether two tests really measure the same psychological function when they have a nonlinear relationship. (8) To describe and evaluate the properties of a specific test considered as a measuring instrument. The model was tested empirically, using it to estimate bivariate distributions from univariate distributions, with good results, as checked by chi-square tests. (Author)

**AD-628 311 Fld. 5/10, 6/1**
**CFSTI Prices: HC $2.60 MF $0.50**
*MOLECULAR PSYCHOBIOLOGY LAB YORK UNIV TORONTO (ONTARIO)*
**NUCLEIC ACID AND PROTEIN CHANGES DURING DEVELOPMENT IN NORMAL AND VISUALLY DEPRIVED RATS.**
Research rept.,
by John Gaito, James Mottin, and Kenneth Koffer. 18 Jan 66, 24p. Rept. no. mpl-3, Contract Nonr-4935 (00),
Unclassified report

Descriptors: (*Nucleic acids, Vision), (*Vision, Sensory deprivation), (*Sensory deprivation, Nucleic acids), Desoxyribonucleic acids, Ribonucleic acids, Brain, Kidneys, Tissues (Biology), Proteins, Rats

A two stage experiment concerned with the neurochemical effects of visual deprivation was conducted. In Stage 1 rats were enucleated at 15 days of age and sacrificed at either 30, 50, 75, or 100 days. Stage 2 research involved removing the eyes at 100 days and sacrificing at 115, 135, 160, or 185 days of age. A littermate normal was housed with each enucleate. No differences were present in the visual cortex in Stage 1 but the control animals had greater protein values and RNA/DNA and protein/DNA ratios in Stage 2. Several other significant results occurred and are discussed. The period of greatest cellular activity was at 50 days or 75 days in all tissues. (Author)

**AD-628 449 Fld. 5/10**
**CFSTI Prices: HC $6.60 MF $0.75**
*NAVAL TRAINING DEVICE CENTER PORT WASHINGTON N Y*
**EFFECTIVENESS AND STUDENT ACCEPTANCE OF INDIRECT PAIRED ASSOCIATES LEARNING.**
Technical rept.,
by George Chajet. 1 Feb 66, 65p. Rept. no. NAVTRADEVCEN IH-42,
Contract N61339-1337, Proj. N7635-2-Pt-2,
Unclassified report

Descriptors: (*Learning, Effectiveness), Memory, Recall, Psychometrics, Attitudes, Correlation techniques, Word association, Students

Direct learning, a conventional paired-associates memorizing task was compared with indirect learning, a game-like memorizing task. The two learning tasks were studied under two conditions: no task overloading and task overloading. Two hundred college students with Verbal SAT scores of 500 or below participated in short learning tasks. It was found that: (1) Direct learning is superior when learning is measured by recall. (2) The two learning tasks are about equally effective when learning is measured by recognition. (3) Direct learning elicits less favorable attitudes. (4) Direct learning appears less resistant to task overloading. (Author)

**AD-628 561 Fld. 5/10**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**REDIRECTING THE SEARCH PROCESS,**
by Ulric Neisser, and Arnold Stoper. 14 Nov 64, 11p. Rept. no. JA-2387A,
Contract AF 19(628)-5167,
ESD TDR-66-23
Unclassified report

Prepared in cooperation with Brandeis Univ., Waltham, Mass., Grant NSF-G21654.

*Availability: Published in Brit. J. Psychol. v56 n4 p359-68 1965. Copies to DDC users only.*

Descriptors: (*Search theory, Reading), (*Vocabulary, Search theory), Visual acuity, Performance tests

Subjects scanned through lists of words looking for proper names. Some lists contained cue words which made it possible to skip a number of lines. One or two seconds were needed to make such a skip; hence cues for short skips were not used. Interpretation is in terms of a higher-order process which controls the scanning pattern. (Author)

**AD-628 562 Fld. 5/10**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**SEARCHING THROUGH WORD LISTS,**
by Ulric Neisser, and Henry K. Keller. 14 Nov 64, 11p. Rept. no. JA-2444,
Contract AF 19(628)-5167,
ESD TDR-66-24
Unclassified report

Prepared in cooperation with Brandeis Univ., Waltham, Mass., Grant NSF-G21654.

*Availability: Published in Brit. J. Psychol. v56 n4 p349-58 1965. Copies to DDC users only.*

Descriptors: (*Search theory, Reading), (*Vocabulary, Search theory), Performance tests, Visual acuity

Two experiments are reported in which subjects searched through lists of words, looking for targets defined only in terms of their meaning (e.g. 'any animal'). Under these conditions, scanning is much slower than when the target is a known word, or a member of a small fixed set. It is argued that printed words are processed in two stages, termed 'stimulus examination' and 'memory examination' respectively. Preliminary data relevant to other aspects of the scanning method are also presented: error rates, the importance of motivation, the extent to which words scanned over can be recognized later, and the relation between scanning and reading aloud. (Author)

**AD-628 624 Fld. 5/10, 5/5**
*MITRE CORP BEDFORD MASS*
**COLOR CODING IN FORMATTED DISPLAYS,**
by Sidney L. Smith, Barbara B. Farquhar, and Donald W. Thomas. 21 Jun 65, 9p. Rept. no. SR-134,
Contract AF 19(628)-2390, Proj. AF-704,
ESD TR-65-125
Unclassified report

*Availability: Published in Journal of Applied Psychology v49 n6 p393-8 1965. Copies to DDC users only.*

Descriptors: (*Display systems, Human engineering), (*Colors, Display systems), Classification, Performance tests, Analysis of variance

An experiment was designed to assess and compare the effects of symbolic, numeric, and color coding in formatted displays. 12 Ss viewed displays in which 2-digit entries were arranged in tabular matrix format. Displays differed in density, structure, and auxiliary coding. Ss performed row-comparison and item-counting tasks, providing time and error measures. Auxiliary color coding resulted in better performance than superscript or underline codes for both tasks. Color coding was relatively more effective for item counting than for row comparison where the display format was related to the task. The value of a display code appears to be dependent upon the joint interaction of the format in which it is displayed and the task to which it is applied. (Author)

**AD-628 638 Fld. 5/10**
*NORTHWESTERN UNIV EVANSTON ILL*
**AN ANALYSIS OF INTRALIST SIMILARITY IN VERBAL LEARNING WITH EXPERIMENTS ON CONCEPTUAL SIMILARITY,**
by Benton J. Underwood, Bruce R. Ekstrand, and Geoffrey Keppel. 1 Sep 64, 16p. Contract Nonr-1228(15) Proj. NR-154-057,
Unclassified report

Prepared in cooperation with California Univ., Berkeley.

*Availability: Published in Journal of Verbal Learning and Verbal Behavior, v4 n6 p447-62 Dec 1965. Copies to DDC users only.*

Descriptors: (*Learning, Word association), (*Verbal behavior, Learning), Analysis of variance, Vocabulary, Semantics, Frequency

An analysis was made of four subprocesses of verbal learning which may be expected to vary as intralist similarity (meaningful, formal, or conceptual) is manipulated in a PA list. Expectations were stated as to the role of each subprocess in over-all PA learning which similarity is manipulated among stimulus terms and among response terms independently. In the initial experiments, lists were constructed to eliminate two of the four subprocesses, leaving response learning and associative interference as the primary factors varying with conceptual similarity. The experiments showed that similarity among all stimulus terms were deleterious to learning while similarity among response terms had no effect on learning. These effects were independent of word frequency. Further experiments, devised to study response learning and associative learning independently, gave plausibility to the notion that with similarity obtaining among response terms, the positive effects of response learning balance the negative effects of associative interference for these materials. A final experiment varied the number of concepts within a list to examine the influence of a further hypothesized factor, S-R limitation. The overt -error data indicated the presence of this subprocess varying in extent as the number of concepts varied. However, the manner in which it contributed to over-all PA learning could not be ascertained. (Author)

**AD-628 639 Fld. 5/10**
*NORTHWESTERN UNIV EVANSTON ILL*
**SIMULATED SIMILARITY AND MEDIATION TIME IN TRANSFER,**
by Elizabeth Schwenn, and Benton J. Underwood. 10 Aug 64, 9p. Contract Nonr-1228(15) Proj. NR-154-057,
Unclassified report

*Availability: Published in Journal of Verbal Learning and Verbal Behavior, v4 n6 p476-83 Dec 1965. Copies to DDC users only.*

Descriptors: (*Transfer of training, Performance tests), Word association, Time, Analysis of variance, Learning

The experiment was designed to determine transfer differences in a simulated A-B, A-B' transfer paradigm. One variable manipulated was degree of associative connection (0, 10, or 30 trials) between two neutral words before using these words as the B and B' terms. On the assumption that transfer following the establishment of the associations between response terms would occur by mediation, the anticipation interval on the transfer test was varied, being 1, 2, or 4 sec. It was expected that an interaction would occur in transfer performance as a function of degree of response-term association and length of anticipation interval. The nine experimental conditions were each represented by 20 Ss. The first transfer list was learned to a criterion of one perfect recitation, the second for 10 trials. Differences in transfer performance were found only on the initial trials. At this point, performance was higher for the groups having had 10 and 30 trials of response-term association than for the groups having none, but there was little difference between the 10 and 30 groups. The expected interaction was not present. The transfer phenomena were not entirely consistent with the notion that mediation was occurring. Neither were they entirely consistent with an alternative explanation which assumed that an association between A and the implicit response to B (B') was developed during the learning of the first transfer list. (Author)

**AD-628 640 Fld. 5/10**
*NORTHWESTERN UNIV EVANSTON ILL*
**FALSE RECOGNITION PRODUCED BY IMPLICIT VERBAL RESPONSES,**
by Benton J. Underwood. 21 Apr 64, 8p. Contract Nonr-1228(15) Proj. NR-154-057,
Unclassified report

*Availability: Published in Journal of Experimental Psychology, v70 n1 p122-9 Jul 1965. Copies to DDC users only.*

Descriptors: (*Learning, Errors), (*Verbal behavior, Learning), (*Recall, Vocabulary), Performance tests, Word association

Two hundred words were read to 100 Ss at a 10-sec. rate. For each word S decided whether it had or had not been read earlier. Critical stimulus words were inserted in the list, these words being presumed to elicit specified implicit responses. Later in the list the assumed implicit response words were presented. For these latter words 3 of 5 classes of words, false recognition was much higher than for control words. The greater the prior frequency of elicitation of the implicit response the greater the likelihood of false recognition. (Author)

**AD-628 641 Fld. 5/10**
*NORTHWESTERN UNIV EVANSTON ILL*
**FREE LEARNING AND RECALL AS A FUNCTION OF UNIT-SEQUENCE AND LETTER-SEQUENCE INTERFERENCE,**
by Bruce R. Ekstrand, and Benton J. Underwood.
13 Jul 64, 8p. Contract Nonr-1228 (15) Proj. NR-154-057,
Unclassified report

*Availability: Published in Journal of Verbal Learning and Verbal Behavior, v4 n4 p390-6 Oct 1965. Copies to DDC users only.*

Descriptors: (*Learning, Psychometrics), (*Recall, Psychometrics), (*Retention, Psychometrics), Performance tests, Vocabulary, Analysis of variance

Free learning was used in two experiments to test the Underwood and Postman (1960) theory of long-term retention. Experiment 1 compared the forgetting of high- and low-meaningful word pairs and high- and low -meaningful letter pairs. The second experiment repeated the comparison of the word pairs with the addition of a free association test just prior to 24-hour recall. This test was designed to 'arouse' all of S's associative systems directly in the experimental context. The results of both experiments showed no differences in retention between the high- and low-meaningful materials. This finding does not agree with the Underwood and Postman theory. Further analyses revealed that free learning is not forgotten appreciably faster than paired-associate or serial learning. Although the theory has had remarkable success in retroactive and proactive situations it is inadequate in its present form for predicting retention of a single list learned by naive Ss. (Author)

**AD-628 651 Fld. 5/10**
*MARYLAND UNIV COLLÉGE PARK DEPT OF PSYCHOLOGY*
**A CROSS-CULTURAL COMPARISON OF PRINTED COMMUNICATION VERSUS SPOKEN COMMUNICATION IN PERSUASION,**
by Elliott McGinnies. 23 Mar 65, 8p. Contract Nonr-3720 (01) Proj. NR-171-250,
Unclassified report

*Availability: Published in Journal of Psychology v60 p1-8 1965. Copies to DDC users only.*

Descriptors: (*Social communication, Effectiveness), (*Visual perception, Social communication), (*Auditory perception, Social communication), Culture, Japan, Psychometrics, Verbal behavior, Reading, Attitudes

The results show a consistent advantage of the written communication over the spoken communication with respect to the three measured variables of attitude change, convincingness ratings of the arguments, and perceptions of the communicator; nevertheless, certain features of this type of situation pose difficulties of interpretation.

**AD-628 690 Fld. 5/10, 5/9**
**CFSTI Prices: HC $2.00 MF $0.50**
*HUMAN FACTORS RESEARCH INC SANTA BARBARA CALIF*
**FACTORS INFLUENCING THE JUDGMENT OF HUMAN PERFORMANCE.**
Final rept.
Feb 66, 36p. Contract Nonr-4140 (00), Proj. NR-153-625,
Unclassified report

Descriptors: (*Performance (Human), Factor analysis), Behavior, Perception (Psychology), Performance tests, Job analysis, Correlation techniques

Even in the simplest situations the valuation arrived at by different persons judging the same phenomena are significantly influenced by such variables as the range of stimulus values presented, the presence or absence of anchor stimuli, prior exposure to similar or dissimilar stimuli, the time interval between presentation of the stimuli and the recording of the judgment, and so on. One can only speculate at the infinitely greater number of pertinent variables in such complex judgmental situations as clinical classification, determination of political strategy, or assessment of performance at a technical work task. It is with this last category of complex judgments, those dealing with assessments of the performance of a work task, that this research was primarily concerned. The methods of study used, however, may have implications for any kind of complex judgmental process.

**AD-628 717 Fld. 5/10**
*TUFTS UNIV MEDFORD MASS INST FOR PSYCHOLOGICAL RESEARCH*
**EXPERIMENTAL DEAFFERENTATION IN MAN,**
by Sanford J. Freedman. 1965, 11p. Contract AF 49 (638)-1282, Proj. AF-9778, Task 977801, AFOSR 65-2678
Unclassified report

*Availability: Published in Symposium Bel-Air II Geneve p79-88 1965. Copies to DDC users only.*

Descriptors: (*Sensory deprivation, Reviews), Social psychology, Training

The problem-oriented studies seem to have been the most successful. It has been found that social interaction helps ward off effects, that having a task to perform limits perceptual disorientation and probably wards off most cognitive effects, and that certain kinds of training are relevant. (Author)

**AD-628 815 Fld. 5/10, 5/7, 5/9**
**CFSTI Prices: HC $4.00 MF $0.75**
*HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA*
**AN OVERVIEW OF THE CONCEPTUAL STRUCTURE OF SUBTASK PIONEER VII.**
Research memo.,
by Joseph F. Follettie. 19 Jul 63, 125p. Contract DA-44-188-ARO-2,
Unclassified report

Descriptors: (*Learning, Language), (*Linguistics, Learning), Verbal behavior, Semantics, Analysis, Education, Training

**AD-628 850 Fld. 5/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PSYCHOLOGY*
**SOME OBSERVATIONS ON THE USE OF FREE WORD ASSOCIATIONS IN THE SELECTION OF WORDS IN THE CONSTRUCTION OF SENTENCES.**
Technical rept.,
by Charles N. Cofer. Aug 65, 12p. Rept. no. TR-9,
Contract Nonr-656 (30) Proj. NR-154-161,
Unclassified report

Report on Learning, Retention and Recovery of Meaningful Materials.

Descriptors: (*Word association, Verbal behavior), (*Verbal behavior, Word association), Psychometrics, Reaction (Psychology), Vocabulary

Thirty 3-word sets were developed, and Ss were asked to write sentences containing one designated word of the three words and one of the two remaining words. It had been expected that associative relations among the words would systematically determine which choice word would be used. The evidence obtained did not support this expectation. A number of limitations in the method and materials employed are indicated as factors reducing the conclusiveness of this study and as problems to be met in further research. (Author)

**AD-628 851 Fld. 5/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PSYCHOLOGY*
**SOME DATA ON CONTROLLED ASSOCIATION.**
Technical rept.,
by Charles N. Cofer. Oct 65, 12p. Rept. no. TR-10,
Contract Nonr-656 (30) Proj. NR-154-161,
Unclassified report

Report on Learning, Retention and Recovery of Meaningful Materials.

Descriptors: (*Word association, Verbal behavior), (*Verbal behavior, Word association), Reaction (Psychology), Psychometrics, Vocabulary

Data from four controlled association (CA) conditions were obtained and compared with free association (FA) response distributions for the same stimuli. It was found that over half the CA responses also occur in FA, though at different frequencies, and that a high proportion of the response frequencies in both CA and FA are accounted for by responses common to both. A wider variety of responses occurred under CA than under FA. From one to two of the three most frequent responses in CA and FA were, on the average, identical. The FA responses which also occur in CA have higher FA frequencies than those which do not appear in CA. Frequencies of the primary, secondary, and tertiary responses in CA and FA show some differences, mainly with respect to the primary. Responses inappropriate to CA instructions occur in CA and the frequency of such responses is associated with their FA frequencies. FA distributions for several stimuli used across CA conditions could be partially synthesized from the CA distributions. It is concluded that, under the conditions of this study, there is substantial similarity in the responses obtained under CA and FA. Conditions which are involved in this result are summarized and contrasted with conditions in which CA responses differ markedly from those obtained in FA. (Author)

**AD-628 852 Fld. 5/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PSYCHOLOGY*
**INCIDENTAL LEARNING WITH WORD PAIRS VARYING IN ASSOCIATIVE OVERLAP AND CATEGORY MEMBERSHIP.**
Technical rept.,
by Charles N. Cofer, and Irvin Guyett. Oct 65, 9p. Rept. no. TR-11,
Contract Nonr-656 (30), Proj. NR-154-161,
Unclassified report

Report on Learning, Retention and Recovery of Meaningful Materials.

Descriptors: (*Word association, Verbal behavior), (*Verbal behavior, Word association), (*Learning, Word association), Psychometrics, Reaction (Psychology), Recall, Vocabulary, Classification

Two experiments were reported, both concerned with the effects of MR values and the presence or absence of categorical relationships within pairs under intentional and incidental learning. In the first experiment free recall was studied, in the second R-S recall after paired-associate learning. In line with prior work in the literature, it was expected that performance on non-categorized, low MR pairs would be inferior under incidental learning but that intentional and incidental learning would show no differences for high MR, non-categorized pairs or for categorized pairs at any MR value. The results do not support these expectations (of an interaction) at all clearly, although the factors of categorization and MR value appear to operate much as past work would predict. The experiments are not considered to be crucial with respect to the expected interaction, as the free-recall lists were short and homogeneous and R-S recall for the pairs used was very high. (Author)

**AD-628 853 Fld. 5/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PSYCHOLOGY*
**FURTHER STUDY OF ASSOCIATIVE REACTIONS TO COMPOUND VERBAL STIMULI.**
Technical rept.,
by Charles N. Cofer. Dec 65, 22p. Rept. no. TR-12,
Contract Nonr-656 (30) Proj. NR-154-161,
Unclassified report

Report on Learning, Retention, and Recovery of Meaningful Materials.

Descriptors: (*Word association, Verbal behavior), (*Verbal behavior, Word association), Learning, Retention, Recall, Psychometrics, Reaction (Psychology), Statistical analysis

Association data were obtained for word compounds (chiefly adjective-noun pairs) and for the component words of the compounds. Ratings were obtained for the compounds on a scale descriptive of the change in meaning in the modified word because of the modifier. Associative overlap scores were computed between each component and the compound, and, for the cases in which common responses occurred to both the components predictions of the frequency with which the common responses would occur to the compound were made. Little or no relationship was found between associative overlap scores and rated meaning change or between the predicted and obtained values for response frequencies to the compounds. A characterization of the compounds is attempted in relation to those in which successful and unsuccessful predictions were made and in relation to rated change in meaning. Brief discussion is provided concerning the rating scales used. (Author)

**AD-628 162 See Fld. 5/9**

**AD-628 236 See Fld. 5/11**

**AD-628 322 See Fld. 6/3**

**AD-628 365 See Fld. 6/1**

**AD-628 366 See Fld. 6/1**

**AD-628 371 See Fld. 6/5**

**AD-628 403 See Fld. 6/16**

**AD-628 444 See Fld. 5/9**

**AD-628 576 See Fld. 5/11**

**AD-628 595 See Fld. 6/5**

**AD-628 752 See Fld. 6/5**

**AD-628 753 See Fld. 5/9**

**AD-628 754 See Fld. 5/9**

## 5/11. SOCIOLOGY

**AD-628 236 Fld. 5/11, 5/10**
**CFSTI Prices: HC $6.60 MF $0.75**
*ELIEZER KAPLAN SCHOOL OF ECONOMICS AND SOCIAL SCIENCES HEBREW UNIV JERUSALEM (ISRAEL)*
**ROLE BEHAVIOUR AND SOCIAL STRUCTURE.**
Technical rept.,
by S. N. Eisenstadt, D. Weintraub, and N. Toren. Sep 65, 69p. Contract AF-EOAR-78-63, AFOSR 2292
Unclassified report

Descriptors: (*Sociology, Behavior), (*Social communication, Sociometrics), Culture, Israel, Job analysis

The major conclusions of the studies on role behaviour and social structure refer to the possibility of differential crystallization of different role-components and the conditions under which successful role-innovation may be found.

**AD-628 576 Fld. 5/11, 5/10**
*MICHIGAN UNIV ANN ARBOR*
**THE EFFECT OF GROUP SUCCESS ON THE REDUCTION OF STATUS INCONGRUENCE IN TASK-ORIENTED GROUPS,**
by Eugene Burnstein, and Robert B. Zajonc. 1964, 15p. Contract Nonr-1224 (34),NSF-GS-570 Proj. NR-170-309,
Unclassified report

*Availability: Published in Sociometry v28 n4 p349-62 Dec 1965. Copies to DDC users only.*

Descriptors: (*Group dynamics, Sociometrics), Social psychology, Analysis of variance, Performance (Human), Reduction

Over a large number of trials observations were made to determine the rapidity with which a group responds to status incongruences and how such responses are influenced by its history of successes and failures. Two dimensions of status are examined: the apparent task ability of a member (performance status) and his influence over the group product (control status). Incongruences were induced by making a member's performance status incommensurate with his control status. It was found that groups with a history of continuously successful outputs and those with a history of intermittent success restructure their hierarchies in order to reduce an incongruence in status ranks. However, this occurs more readily in the former condition than in the latter. Members experiencing large incongruences, especially when they possess the greatest control, tended to respond more rapidly to the need for optimal restructuring, except when this entailed their being severely downgraded. (Author)

# Field 6-BIOLOGICAL AND MEDICAL SCIENCES

## 6/1. BIOCHEMISTRY

**AD-628 045 Fld. 6/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*FARR CYTOCHEMICAL LABS CAMDEN MAINE*
**RESEARCH ON CELL WALL CYTOCHEMISTRY OF SELECTED FUNGI.**
Final rept. 15 Mar 64-10 Mar 65,
by Wanda K. Farr. Oct 65, 91p. Contract AF 33(615)-1544, Proj. AF-7164, Task 716405, AMRL TR-65-151
Unclassified report

Descriptors: (*Polysaccharides, Cell wall), (*Fungi, Cytochemistry), (*Cytochemistry, Cell wall), Hydrolysis, Enzymes, Food, Astronauts

Cytochemical analyses of the four imperfect fungi, Cylindrocephalum sp., Curvularia lunata, Aspergillus oryzae, and Gliocladium deliquescens showed that the resistant material in their cell walls is chitin. All efforts to identify cellulose produced negative results. Solutions of chitinase-containing Worthington Lysozyme (Muramidase) in concentrations of 0.5mg./ml. brought about dissolution of the cell walls and dispersion of the cell contents. Enzymatic hydrolysis represents the most suitable method now available for the conversion of fungal cell wall chitin to digestible end products with the simultaneous release of nutrient substances in the protoplasm. Specific studies have continued on protoplasmic phenomena within the cells of fungi examined, especially Heterocephalum aurantiacum Plastid-like structures in the protoplasts are the cell organs which produce chitin. Chitin-forming plastids increase in number by direct division and the quantities of chitin at their surfaces, in a given cell, may be equal to or greater than the amount of chitin in the cell wall. This information necessitates the inclusion of chitin located in the protoplasts, as well as that in the cell walls, in any considerations of fungal tissues as food for astronauts in extended explorations of space. (Author)

**AD-628 167 Fld. 6/1, 6/16**
*SUFFIELD EXPERIMENTAL STATION RALSTON (ALBERTA)*
**BIOLOGICAL ACTIVITY OF BOVINE BRAIN CONSTITUENTS.**
Technical paper,
by R. K. Shaw, B. H. Chandler, and W. C. Stewart. 3 Jun 65, 9p. Rept. no. Suffield TP-257, Proj. DRB-D52-20-20-28,
Unclassified report

*Availability: Published in Canadian Journal of Physiology and Pharmacology, v44 p69-76 1966. Copies to DDC users only.*

Descriptors: (*Brain, Tissue extracts), (*Tissue extracts, Chemical analysis), Electrophoresis, Peptides, Canada, Chemical properties, Biochemistry, Bovines, Chromatographic analysis

Bovine brain extracts were fractionated into 89 different subfractions, and the serotonin-like and acetylcholine-like properties of each determined. Thirty-three of the subfractions exhibited biological activity: 6 possessed acetylcholine-like activity; 5 possessed serotonin-like activity; 12 possessed activity of an unknown type; and the remaining 10 possessed more than one type of activity. Eighty of the subfractions contained peptides as revealed by acid hydrolysis. However, it was not established whether the peptides accounted for the biological activities noted. (Author)

**AD-628 263 Fld. 6/1, 6/5**
*ARMED FORCES INST OF PATHOLOGY WASHINGTON D C*
**STUDIES ON NECROSIS OF MOUSE LIVER IN VITRO. ALTERATIONS IN ACTIVITIES OF SUCCINOXIDASE, SUCCINIC DEHYDROGENASE, GLUTAMIC DEHYDROGENASE, ACID PHOSPHATASE, URICASE, GLUCOSE-6-PHOSPHATASE AND NAD-PYROPHOSPHORYLASE,**
by Charles C. Griffin, Vaman S. Waravdekar, Benjamin F. Trump, Peter J. Goldblatt, and Robert E. Stowell. 1965, 18p.
Unclassified report

*Availability: Published in The American Journal of Pathology v47 n5 p833-50 Nov 1965. Copies to DDC users only.*

Descriptors: (*Liver, Necrosis), (*Necrosis, Enzymes), (*Cytochemistry, Necrosis), Oxi-

doreductases, Phosphoric monoester hydrolases, Cell structure, In vitro studies, Nuclei (Biology), Mitochondria

**AD-628 264 Fld. 6/1, 7/3**
*MINNESOTA UNIV MINNEAPOLIS LAB FOR BIOPHYSICAL CHEMISTRY*
**SUBSTRATE CONTROL OF PROTEIN CONFORMATION,**
by R. Lumry. 1964, 13p.

Unclassified report

Jenaer Symposium on Physikalische Chemie Biogener Makromolekule (2nd), 18-21 Sep 63 (Germany).

*Availability: Published in Deutsche Akademie der Wissenschaften zu Berlin Abhandlungen Klasse fuer Medizin (Germany) n6 p125-36 1964. Copies to DDC users only.*

Descriptors: (*Stereochemistry, Proteins), (*Proteins, Stereochemistry), (*Hemoglobin, Stereochemistry), (*Chymotrypsin, Stereochemistry), Chemical bonds, Chromoproteins, Catalysis, pH, Molecular rotation, Enzymes

As presently known, the special physiological reactions of proteins are due to (1) the passive positioning of reactants near ionizable groups of the protein; (2) the effective local dielectric constant; and (3) the distortion of primary bonds of the substrate and of the protein produced in folding the protein (the 'rack' effect). The relative importance of (2) and (3) for heme protein is discussed and the mechanism of the participation of (3) in hemoglobin and cytochrome c is presented. The present status of attempts to detect conformation changes in chymotrypsin during its catalytic reaction is discussed. At present there is no evidence for drastic changes at normal pH values for the reaction. Optical rotation and reversible thermal denaturation studies indicate significant changes in conformation at extremes of pH and these have proved valuable in studying the changes in the conformation necessary to support catalysis. A new kind of conformation change is suggested in which only small displacements in the protein structure take place but convert the protein from catalytically inactive to a catalytically active form. It is possible that this change is associated with the freezing out of side chain rotation. (Author)

**AD-628 270 Fld. 6/1, 6/3**
*CORNELL UNIV ITHACA N Y DEPT OF BIOCHEMISTRY*
**EFFECT OF PHOSPHORYLATED COMPOUNDS AND INHIBITORS ON C02 FIXATION BY INTACT SPINACH CHLOROPLASTS,**
by Elchanan S. Bamberger, and Martin Gibbs. 9 Mar 65, 10p. Contract AF 49 (638)-798, Proj. AF-9777, Task 977701,
AFOSR 65-2959

Unclassified report

*Availability: Published in Plant Physiology, v40 n5 p919-26 Sep 1965. Copies to DDC users only.*

Descriptors: (*Plants (Botany), Metabolism), (*Carbon dioxide, Metabolism), (*Chloroplasts, Carbon dioxide), Saccharide phosphates, Antimetabolites, Tracer studies, Photosynthesis, Acetamides, Arsenic compounds

The effect of some phosphorylated compounds principally sugar phosphates and the inhibitors, arsenite and iodoacetamide, upon CO2 fixation by intact spinach chloroplasts under anaerobic conditions was studied. Ribulose-1,5diphosphate, fructose-1,6-diphosphate, ribose-5-phosphate, glyceraldehyde-3-phosphate, dihydroxyacetone phosphate and glycerate-3-phosphate enhance the rate, sedoheptulose -7-phosphate and -1,7-diphosphate inhibit, erythrose-4phosphate, glycolaldehyde phosphate, L-alpha-glycerol phosphate and phosphoenolpyruvate have no effect while fructose-6-phosphate and glucose-6-phosphate yield inconclusive results. The phosphorylated compounds affect CO2 fixation by filling up the pools of the photosynthetic carbon cycle depleted during isolation of the chloroplast. Inhibition of CO2 fixation by iodoacetamide and arsenite is relieved by the compounds which enhance fixation. Light also protects against inhibition of CO2 fixation by iodoacetamide and arsenite. (Author)

**AD-628 283 Fld. 6/1, 7/3, 7/4**
*STANFORD UNIV CALIF DEPT OF CHEMISTRY*
**THE CONFIGURATION OF RANDOM POLYPEPTIDE CHAINS. II, THEORY,**
by David A. Brant, and Paul J. Flory. 6 Mar 65, 12p. Contract AF 49 (638)-1341,
AFOSR 65-2397

Unclassified report

*Availability: Published in Journal of the American Chemical Society v87 n13 p2791-99 Jul 5 1965. Copies to DDC users only.*

Descriptors: (*Peptides, Molecular structure), (*Polymers, Molecular structure), Stereochemistry, Molecular isomerism, Statistical analysis, Chemical bonds, Electrostatics, Molecular association, Theory

The experimentally measured dimensions of polypeptide chains in the unperturbed, random coil form were successfully correlated with the chain structure using the rotational isomeric state model and statistical mechanical methods applicable to linear systems of interacting subunits. The polypeptide chain with all its amide groups in the trans conformation may be treated as a sequence of virtual bonds of fixed length connecting successive alpha-carbons; the mutual orientation of a pair of adjoining virtual bonds is determined by the angles of rotation about the single bonds at the intervening alpha -carbon atom. Contributions to the configuration energy from bond rotation (torsional) potentials and interactions between nonbonded atoms and groups have been assessed and subsequently evaluated using approximate analytical expressions. From the chain geometry and the character of these interactions, it is shown that the mutual orientation of a given pair of adjoining virtual bonds is sensibly independent of the orientations of all other virtual bonds inhe chain. Electrostatic interactions between amide groups, heretofore ignored, markedly affect the configuration. Satisfactory agreement between theoretical calculations and experimental results is achieved only by taking account of these dipolar interactions, in addition to the relevant torsional and van der Waals energies. The dependence of the polypeptide unperturbed dimensions on chain length was investigated also. (Author)

**AD-628 312 Fld. 6/1**
**CFSTI Prices: HC $1.10 MF $0.50**
*CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD*
**O-RING JOINT TUBES FOR PROTEIN-HYDROLYSATES.**
Rept. for Aug-Sep 65,
by N. K. Schaffer, R. A. Balakir, V. Riley, and T. E. Moffitt. Dec 65, 10p. Rept. no. CRDLR-3352,
Task 1A013001A03902,

Unclassified report

Descriptors: (*Laboratory equipment, Design), (*Proteins, Hydrolysis), O-rings, Halocarbon plastics, Clamps, Amino acids

Serine and theonine were hydrolyzed in newly designed tubes featuring O-ring joints. Design features of the apparatus include (1) a Teflon stopcock sealed to an O-ring connector tube, (2) a Teflon plug secured by a new sealing clamp, and (3) a Teflon O-ring used in the O-ring joint. This technique was compared with the sealed-tube procedure; the above amino acids were equally decomposed in both types of apparatus. The O-ring joint tube can be reused, thereby eliminating sealing and opening of evacuated hydrolysis tubes. (Author)

**AD-628 365 Fld. 6/1, 5/10**
*GOTEBORG UNIV (SWEDEN) INST OF NEUROBIOLOGY*
**A DIFFERENTIATION IN RNA RESPONSE IN NEURONS EARLY AND LATE DURING LEARNING,**
by H. Hyden, and P. W. Lange. 19 Mar 65, 10p. Contract AF-EOAR-28 63, Proj. AF-9777, Task 977701,
AFOSR 65-2517

Unclassified report

*Availability: Published in Proceedings of the National Academy of Sciences, v53 n5 p946-52 May 1965. Copies to DDC users only.*

Descriptors: (*Ribonucleic acids, Biosynthesis), (*Learning, Ribonucleic acids), Nerve cells, Brain, Behavior, Transfer of training, Ribosomes, Rats, Sweden

The amount and composition of nuclear RNA formed in cortical neurons and in vestibular neurons of the brain stem in two types of learning experiments have been determined. Early during transfer of handedness, the cortical neurons produced a small amount of RNA with high adenine and uracil values. Later during the learning period, but still on the rising part of the performance curve, the RNA formed increased in amount, and changed in base composition to an RNA of a ribosomal type. This differentiation in response was interpreted to reflect a genic stimulation of the neurons with an initial synthesis of adenine-uracil-rich RNA. In the phylogentically older vestibular neurons, a highly asymmetric, adenine-rich nuclear RNA was formed in the rats which increased their performance linearly with time during learning. Some animals showed a nonlinear performance curve. The nuclear RNA formed in the neurons of these rats had a ribosomal type of base composition. (Author)

**AD-628 366 Fld. 6/1, 5/10**
*GOTEBORG UNIV (SWEDEN) INST OF NEUROBIOLOGY*
**CHANGES IN RNA CONTENT AND BASE COMPOSITION IN CORTICAL NEURONS OF RATS IN A LEARNING EXPERIMENT INVOLVING TRANSFER OF HANDEDNESS,**
by H. Hyden, and E. Egyhazi. 29 Jul 64, 7p. Contract AF-EOAR-28-63,
AFOSR 65-2518

Unclassified report

*Availability: Published in Proceedings of the National Academy of Sciences, v52 n4 p1030-5 Oct 1964. Copies to DDC users only.*

Descriptors: (*Ribonucleic acids, Biosynthesis), (*Learning, Ribonucleic acids), Transfer of training, Brain, Nerve cells, Rats, Sweden

The RNA content and base ratios of cortical neurons were studied in rats during transfer of handedness. Corresponding neurons in the contralateral part of the same cortex served as controls. The RNA content increased significantly in these neurons which have large nuclei relative to the cytoplasni mass. The (G + C)/ (A + U) ratio of the RNA decreased, indicating that the new RNA produced during learning is of the messenger type. (Author)

**AD-628 390 Fld. 6/1**
*LEICESTER UNIV (ENGLAND) DEPT OF BIOCHEMISTRY*
**PURIFICATION AND PROPERTIES OF ACYLTRANSFERASES FROM PSEUDOMONAS AERUGINOSA,**
by M. Kelly, and H. L. Kornberg. 13 Apr 64, 12p. Contract AF-EOAR-62-77,
AFOSR 65-2971

Unclassified report

*Availability: Published in Biochem. J. (Gt. Brit.) v93 p557-66 1964. Copies to DDC users only.*

Descriptors: (*Transferases, Pseudomonas aeroginosa), (*Pseudomonas aeroginosa, Enzymes), (*Amide hydrolases, Pseudomonas aeroginosa), Culture media, Aliphatic compounds, Amides, Amines, Enzyme inhibitors, Purification, Reaction kinetics, Thiourea, Acetates, Benzoates, Great Britain

Two preparations of amidase, of similar final specific activities, were obtained from Pseudomonas aeruginosa 8602/A grown on acetate plus ammonia, and on acetamide, as carbon and nitrogen sources. The purified enzymes catalysed the transfer of the acyl moieties of a number of aliphatic amides to water (amidase activity) and to hydroxylamine (amide-transferase activity); to a smaller extent they also catalysed the transfer to hydroxylamine of the acyl moieties of several aliphatic acids (acid-transferase activity). Both enzymes exhibited the same substrate specificity. The ratios of the amidase, amide-transferase and acid-transferase activities exhibited by each enzyme varied in an identical manner with different substrates. Both enzymes exhibited identical kinetic properties. The amidase activity of both enzymes was non-competitively inhibited by urea and by N-methylurea; these inhibitions were reversed by hydroxylamine. Thiourea did not inhibit. The amide-transferase and acid-transferase activities of both enzymes were inhibited by iodoacetate and by p-hydroxymercuribenzoate: the inhibition caused by the latter compound was reversed by cysteine. (Author)

**AD-628 420 Fld. 6/1, 7/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**ON PROTEINS OF CABBAGE: REPORT 1. AMINO ACID CONTENT OF PROTEINS,**
by N. N. Melteva. 4 Feb 66, 5p. Rept. no. I-9054-C,
TT 66-60604

Unclassified report

O Belkovykh Veshchestvakh Kapusty Coobshchenie 1. Aminokislotnyj Sostav Belkovykh Weshchestv, trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Pischevaya Tekhnologiya (USSR) n1 p61-3 1964.

Descriptors: (*Vegetables, Proteins), (*Amino acids, Vegetables), (*Proteins, Thin layer chromatography), Plants (Botany), Tissue extracts, Organic phosphorus compounds, Chemical analysis, USSR

Soluble proteins were isolated from cabbage leaves containing 2.6% phosphor, proteins from the pulp containing 0.14% phosphor. It is shown by the unidimensional chromatographic method that the amino acid content of these substances is analogous from one to another and, for certain amino acids, is near the protein content of cabbage seeds. (Author)

**AD-628 584 Fld. 6/1, 15/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER*
**DETECTION AND IDENTIFICATION OF CHEMICAL SIGNATURES.**
Final rept. 15 Sep 64-14 Sep 65,
by B. K. Krotsozynski, and A. Dravnieks. 12 Oct 65, 81p. Rept. no. IITRI-U6012-4,
Contract DA-11-022-AMC-1775 (X) Proj. U6012,

Unclassified report

Descriptors: (*Humans, Identification), (*Gas analysis, Humans), (*Chromatographic analysis, Humans), Vapors, Chemicals, Airborne, Detection, Samplers, Gas chromatography, Odors, Spectrum signatures, Military personnel

The investigation was initiated to study human airborne chemical signatures. A novel apparatus was designed and constructed with inner surfaces of glass and Teflon to permit close control of experimental environment and to monitor humidity and oxygen content. An efficient signature collection system was developed, and techniques of sample acquisition and gas chromatographic analysis were established. The results of signature collection experiments performed on selected human subjects revealed several important features. Seven signature components were found to be common to white, Negro, and Indian males and a white female. It is probable that ethanol, butanol, acetone, and pyruvic and lactic acids are among the common components. Other compounds were found to be common to selected pairs of subjects compared. Some components were characteristic only of a certain individual among those studied and either do not occur in others or exist below the detection limits. Chemical signatures from the same white male individual obtained 14 days apart exhibited large similarities. Less significant similarities were observed between the latter signatures and those from other subjects. (Author)

**A-628 645 Fld. 6/1**
*COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS*
**THE INACTIVATION OF CHYMOTRYPSIN BY DIPHENYLCARBAMYL CHLORIDE AND ITS REACTIVATION BY NUCLEOPHILIC AGENTS.**
Revised ed.,
by Bernard F. Erlanger, A. G. Cooper, and William Cohen. 25 Oct 65, 7p. Contract Nonr-266 (73) (PHS-GM-11805-06

Unclassified report

Revision of manuscript submitted 20 Sep 65.

*Availability: Published in Biochemistry, v5 n1 p190-6 Jan 1966. Copies to DDC users only.*

Descriptors: (*Chymotrypsin, Enzyme inhibitors), (*Enzyme inhibitors, Organic nitrogen compounds), Trypsin, Antimetabolites, Reaction kinetics, Indoles, pH, Amines, Ketones

Diphenylcarbamyl chloride (DPCC) was found to inactivate chymotrypsin and trypsin by means of a 1:1 stoichiometric reaction. The reation was relatively specific for chymotrypsin, which was inactivated 80 times faster than trypsin. Km for the reaction with chymotrypsin was found to be 0.6 plus or minus 0.00002-4 M at pH 8.0. The inactivation of chymotrypsin could be competitively inhibited by indole. DPCC was unreactive toward chymotrypsinogen, diethylphosphorylchymotrypsin, and pepsin. The pH-rate profile of the reaction of DPCC with chymotrypsin was bell shaped, with an optimum at 7.8.Its proton release curve was complex; only in the region near pH 5.0-5.5 was 1 equiv of H (+) released.The inactive product, DPC-chymotrypsin, could be reactivated by a number of nucleophilic agents including hydroxylamine, isonitroacetone, and acyl hydroxamic acids. The experimental data are interpreted with respect to their contribution toward an understanding of the enzymic mechanism of chymotrypsin. (Author)

**AD-628 821 Fld. 6/1, 6/13**
*SHEFFIELD UNIV (ENGLAND) DEPT OF BIOCHEMISTRY*
**USE OF A PURIFIED BACTERIAL FORMATE DEHYDROGENASE FOR THE MICRO-ESTIMATION OF FORMATE,**
by Patricia A. Johnson, M. C. Jones-Mortimer, and J. R. Quayle. 6 Mar 64, 5p. Contract AF-EOAR-8-64,
AFOSR 65-2188

Unclassified report

Prepared in cooperation with Oxford Univ. (England).

*Availability: Published in Biochimica et Biophysica Acta, v89 p351-3 1964. Copies to DDC users only.*

Descriptors: (*Formic acids, Chemical analysis), (*Pseudomonas, Enzymes), Salts, Oxidoreductases, Culture media, Great Britain

**AD-628 115** **See Fld. 6/16**

**AD-628 311** **See Fld. 5/10**

**AD-628 325** **See Fld. 6/13**

**AD-628 358** **See Fld. 6/16**

**AD-628 391** **See Fld. 6/13**

**AD-628 433** **See Fld. 6/16**

**AD-628 435** **See Fld. 6/16**

**AD-628 741** **See Fld. 6/16**

**AD-628 759** **See Fld. 20/6**

## 6/2. BIOENGINEERING

**AD-628 262 Fld. 6/2**
*ARCTIC INST OF NORTH AMERICA WASHINGTON D C*
**BODY MOISTURE AND THE OPERATING LIFE OF IMPLANTABLE HEART RATE TRANSMITTERS,**
by Gerry L. Shook, and G. Edgar Folk,Jr.. 2 Oct 64, 7p. Contract Nonr-3996 (01) Proj. NR-307-105,

Unclassified report

Prepared in cooperation with Iowa State Univ. of Iowa, Iowa City.

*Availability: Published in IEEE Transactions on BioMedical Engineering vBM12 n1 p44-6 Jan 1965. Copies to DDC users only.*

Descriptors: (*Radio transmitters, Implants), (*Implants, Radio transmitters), Moisture, Life expectancy, Heart, Rhythm (Biology), Mammals, Body fluids, Pulse rate

The long life, short range, implantable heart rate transmitters, which have been referred to as the Iowa Type transmitters, have a theoretical operating life of over 300 days. Several years use of the transmitters has shown that the actual operating life of the transmitters may be shortened considerably by moisture leakage from the body cavity of the animal into the transmitter. Several techniques have now been developed which stop this moisture leakage. (Author)

**AD-628 245** **See Fld. 6/3**

## 6/3. BIOLOGY

**AD-628 106 Fld. 6/3, 6/6, 6/5**
**CFSTI Prices: HC $5.60 MF $0.75**
*PACAF EPIDEMIOLOGICAL LAB SAN FRANCISCO CALIF 96274 EPIDEMIOLOGICAL FLIGHT (5TH)*
**KEYS TO THE ADULT FEMALE AND LARVAL ANOPHELINE MOSQUITOES OF THE PHILIPPINES.**
Technical rept.,
by F. E. Baisas, and F. H. Dowell. Nov 65, 58p. Rept. no. TR-13-65,

Unclassified report

Descriptors: (*Anopheles, Morphology (Biology)), (*Culicidae, Morphology (Biology)), (*Disease vectors, Philippines), Larvae

Contents: List of Philippine anophelines; Adult female subgeneric characters; A key to adult female Philippine Anopheles (subgenus anopheles,

subgenus cellia); Characters used in classification of Philippine anopheline larvae; Larval subgeneric characters; A key to larval Philippine anopheles (subgenus anopheles, subgenus cellia).

**AD-628 237 Fld. 6/3**
**CFSTI Prices: HC $1.10 MF $0.50**
*UNIVERSITY COLL LONDON (ENGLAND) DEPT OF ANATOMY*
**FINAL REPORT ON GRANT NO. AF-EOAR-62-37,**
by J. Z. Young. 17 Nov 65, 4p. Contract AF-EOAR-62-37,
AFOSR 65-2654

Unclassified report

Descriptors: (*Cephalopoda, Neurology), (*Nervous system, Cephalopoda), Optic nerve, Electroetinography, Electrophysiology, Great Britain

The work showed how the animals may be prepared and kept for electrical recording. It made a beginning with the study of afferent impulses in the optic nerves. The presence of efferent impulses in the optic nerves and their influence on the electroretinogram. Impulses were shown for the first time in nerve fibres of the statocyst. Individual fibres of the lateral crista have been shown to respond both to low-frequency vibration and to angular acceleration. The latter response varied with the direction of rotation. (Author)

**AD-628 245 Fld. 6/3, 6/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*AERONUTRONIC DIV PHILCO CORP NEWPORT BEACH CALIF*
**APPLICABILITY OF OLFACTORY TRANSDUCERS TO THE DETECTION OF HUMAN BEINGS.**
Quarterly status rept. no. 4, 1 Nov 65-31 Jan 66,
by H. A. Ells. 31 Jan 66, 4p. Rept. no. u-3452,
Contract N600-63637 ,ARPA Order-386

Unclassified report

See also AD-602 298.

Descriptors: (*Humans, Detection), (*Sensory perception, Amphibians), Electrophysiology, Odors, Thresholds (Physiology), Histology, Adenosine phosphates, Gas chromatography, Sense organs, Oscilloscopes, Transducers, Cytology

**AD-628 322 Fld. 6/3, 5/10**
**CFSTI Prices: HC $5.60 MF $0.50**
*STOCKHOLM UNIV (SWEDEN) DEPT OF ZOOLOGY*
**NEURAL MECHANISMS INVOLVED IN INSTINCTIVE BEHAVIOR.**
Final scientific rept.,
by Eric Fabricius. 29 Oct 65, 56p. Contract AF-EOAR-25-63,
AFOSR 66-0179

Unclassified report

Descriptors: (*Behavior, Pigeons), Neurology, Learning, Retention, Sweden, Fear, Mammals

Lesions at particular telencephalic loci may effect reproductive behavior, fear responses and/or learning and retention in the pigeon. Certain critical periods are described in the ontogeny of social behavior in the pigeon and building behavior in the beaver. (Author)

**AD-628 370 Fld. 6/3**
*UNIVERSITY COLL LONDON (ENGLAND) DEPT OF ANATOMY*
**SOME OBSERVATIONS ON THE FOOD INTAKE AND LEARNING IN OCTOPUS VULGARIS,**
by Marion Nixon. 29 Sep 64, 13p. Contract AF-EOAR-2-63,
AFOSR 65-2841

Unclassified report

*Availability: Published in Pubb Staz. Zool., Napoli v34 p329-39 1965. Copies to DDC users only.*

Descriptors: (*Cephalopoda, Learning), Diet, Conditioned reflex, Behavior, Body weight

Octopus vulgaris seems able to learn to attack a rectangular shape when the correct response is rewarded by actual food, (16 g of fish a day for animals weighing 200-350 g) whereas animals given a taste of fish at each trial only responded initially to the shape and did not maintain their attacks. Octopuses that were completely starved only attacked the shape infrequently. However the 'attack system' of the animals was not impaired after starvation and virtual starvation lasting 12 1/2 days in the laboratory, for when shown a live crab it was attacked by the octopuses. All of the animals that were starved or virtually starved lost weight but the animals given 16 g of fish a day all gained weight. (Author)

**AD-628 376 Fld. 6/3**
*PISA UNIV (ITALY) ISTITUTO DI FISIOLOGIA*
**RESEARCH ON THE STRUCTURE AND PHYSIOLOGY OF THE EYES OF A LYCOSID SPIDER. III. ELECTRORETINOGRAPHIC RESPONSES TO POLARIZED LIGHT,**
by F. Magni, F. Papi, H. E. Savely, and P. Tongiorgi. 1965, 17p. Contract AF-EOAR-62-9,
Proj. AF-9777, Task 977701,
AFOSR 65-2946

Unclassified report

*Availability: Published in Arch. Ital. Biol. v103 p146-158 1965. Copies to DDC users only.*

Descriptors: (*Arachnids, Electroretinography), Eye, Arthropods, Photosensitivity (Biological), Light, Polarization, Adaptation (Physiology), Response, Retina, Italy

The electroretinographic responses of the anterior median and posterior median eyes of Arctosa variana C. L. Koch to flashes of polarized light of the same intensity, show maxima and minima upon rotation of the plane of polarization. The effect disappears when the eye is adapted to a strong background light. The analiser mechanism is located at the level of the retina. (Author)

**AD-628 476 Fld. 6/3**
*ARMED FORCES INST OF PATHOLOGY WASHINGTON D C*
**EPIZOOTIOLOGIC STUDIES ON FILARIOIDS OF THE RACCOON,**
by Carlton M. Herman, and Donald L. Price. 20 Oct 64, 7p.

Unclassified report

Prepared in cooperation with Patuxent Wildlife Research Center, Laurel, Md.

*Availability: Published in Journal of Wildlife Management, v29 n4 p694-9 Oct 1965. Copies to DDC users only.*

Descriptors: (*Filariae, Mammals), (*Disease vectors, Filariae), Ticks, Larvae, Arthropods, Culicidae, Aedes, Anopheles, Culicidae, Life cycle, Maryland

Filarioid worms (Dirofilaria immitis, D. tenuis, Dipetalonema procyonis, and D. llewellyn) were discovered in raccoons (Procyon lotor) in Maryland. Raccoons were trapped in lowland, upland, and agricultural-residential areas, which were further classified as stream borders, poorly drained, and well drained. Data on incidence of D. llewellyni were analyzed on basis of host distribution within these areas to indicate type of habitat in which one might seek the vector. It was concluded that exposure takes place in the spring of the year. The arthropod found associated most often with the raccoon in spring was Ixodes texanus. Larvae of this tick which were fed on infected raccoons presented no evidence of development of the microfilariae. Feeding experiments were also conducted with mosquitoes: Aedes aegypti, A. canadensis, A. sollicitans, A. triseriatus, A. vexans, Culex pipiens, Anopheles punctipennis, and A. quadrimaculatus. Although microfilariae remained alive and active in the gut contents of all these mosquitoes for 2 days, only in Aedes aegypti did they enter the hemocele, but no developmental changes were noted and all microfilariae were dead by the eight day. Although the intermediate host of D. llewellyni was not determined, evaluation of the accumulated data provides criteria for seeking the vector. (Author)

**AD-628 687 Fld. 6/3, 12/1**
*PRINCETON UNIV N J DEPT OF GEOLOGY*
**SEMIFORMAL REPRESENTATION OF ORGANISMIC CONCEPTS,**
by Walter M. Elsasser. 4 Oct 65, 8p. Contract Nonr-1858 (52),

Unclassified report

*Availability: Published in Proceedings of the National Academy of Sciences, v54 n5 p1431-6 Nov 1965. Copies to DDC users only.*

Descriptors: (*Statistical mechanics, Biology), (*Biology, Statistical mechanics), Physiology, Biochemistry, Mathematical models, Theory

Statistical mechanics are applied to processes in the living organism.

**AD-628 688 Fld. 6/3**
*NORTHWESTERN UNIV EVANSTON ILL*
**CIRCADIAN RHYTHM AND THE PHOTOPERIODIC REGULATION OF THE ANNUAL REPRODUCTIVE CYCLE IN BIRDS,**
by Albert Wolfson. 1965, 10p. Contract Nonr-1228 (28) ,NSF-GB-1041

Unclassified report

*Availability: Published in Circadian Clocks, Proceedings of the feldafing Summer School, Amsterdam Sept 7-18 1964. Copies to DDC users only.*

Descriptors: (*Birds, Rhythm (Biology)), (*Rhythm (Biology), Birds), (*Reproductive system, Rhythm (Biology)), (*Photoperiodism, Birds), Theory

Theories are postulated concerning the relationship of the circadian rhythm and of the photoperiodic regulation to the preparatory and progressive phases of the annual gonadal cycle regulatory mechanism.

**AD-628 727 Fld. 6/3, 6/16**
*CALIFORNIA INST OF TECH PASADENA DIV OF BIOLOGY*
**THE DEMONSTRATION AND MANIPULATION OF A CIRCADIAN RHYTHM IN A SINGLE NEURON,**
by Felix Strumwasser. 1964, 21p. Contract AF 49 (638)-1447,
AFOSR 65-2751

Unclassified report

Prepared in cooperation with Washington School of Psychiatry, D. C. Contract DA-49-193-MD-2119.

*Availability: Published in Circadian Clocks p442-62 1965. Copies to DDC users only.*

Descriptors: (*Rhythm (Biology), Nerve cells), Electrophysiology, Photoperiodism, Ganglia, Ribonucleic acids, Desoxyribonucleic acids, Biosynthesis, Periodic variations

**AD-628 743 Fld. 6/3**
*UNIVERSITY COLL LONDON (ENGLAND)*
**OCTOPUS OPTIC RESPONSES,**
by B. B. Boycott, J. Y. Lettvin, H. R. Maturana, and P. D. Wall. 22 Jan 65, 12p. Contract AF-EOAR-42-64, AFOSR 65-2525
Unclassified report

*Availability: Published in Experimental Neurology, v12 n3 p247-56 Jul 1965. Copies to DDC users only.*

Descriptors: (*Cephalopoda, Vision), Eye, Response, Electroretinography, Optic nerve, Retina, Nerve impulses, Great Britain

A study of responses in Octopus vulgaris visual system was carried out. Gross recordings were made in the free swimming animal responding to brief flashes of light. A simple negative electroretinogram was recorded within the eye beginning at 8 msec peaking at 20-25 msec. With the animal resting, the amplitude of the ERG could be increased by gentle tactile stimuli which produce no movement or pupil change. Immediately behind the retina, an oscillating potential was recorded beginning 15 msec after the flash and lasting for about 40 msec with a frequency of about 150 per second. This was believed to be produced by synchronized volleys in the optic nerve fibers travelling at about 1 m per sec. In the optic lobe, one could record the ERG, the arriving oscillatory volley and a gross response starting at 30 msec after the flash and peaking 20 msec later. (Author)

**AD-628 805 Fld. 6/3**
**CFSTI Prices: HC $1.60 MF $0.50**
*NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF*
**WOUNDING RESPONSE IN RELATION TO POLAR TRANSPORT OF RADIOCALCIUM IN ISOLATED ROOT SEGMENTS OF ZEA MAYS,**
by Evan C. Evans,III, and Burton E. Vaughn. 3 Jan 66, 20p. Rept. no. USNRDL-TR-963, Proj. SF-011-01-01, Task 0401,
Unclassified report

Descriptors: (*Corn, Transport properties), (*Radioactive isotopes, Corn), Tissues (Biology), Ions, Tracer studies, Diffusion, Calcium, Plants (Botany), Soils, Healing, Wounds + injuries, Absorption (Biological)

Simultaneous, separate determinations of radiocalcium transport in paired corn root segments were demonstrated by a perfusion bridge. Investigations with this new apparatus revealed an heretofore unknown transient in the tracer movement during the first 2 hours after excision. Investigations of the transient suggests that it is a result of woulding and repair, coupled with certain other metabolically mediated processes in organized root tissue. (Author)

**AD-628 105** See Fld. 6/6

**AD-628 153** See Fld. 6/13

**AD-628 176** See Fld. 6/20

**AD-628 270** See Fld. 6/1

**AD-628 325** See Fld. 6/13

**AD-628 408** See Fld. 8/1

**AD-628 589** See Fld. 8/1

**AD-628 590** See Fld. 8/1

**AD-628 591** See Fld. 8/1

**AD-628 592** See Fld. 8/1

**AD-628 684** See Fld. 9/4

## 6/4. BIONICS

**AD-628 141 Fld. 6/4, 5/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM RESEARCH LTD RICHMOND (ENGLAND)*
**SOME COMMENTS ON THE ORGANIZATION OF MEN, MACHINES, AND CONCEPTS,**
by Gordon Pask. 1965, 23p. Contract AF61 (052)-640,AF 61 (052)-402 Proj. AF-9769, Task 976904,
AFOSR 65-2666
Unclassified report

Proceedings of American Documentation Institute Working Symposium on 'Education for Information Science,' Airlie House, Va., 7-10 Sep 1965.

Descriptors: (*Cybernetics, Symposia), (*Man-machine systems, Symposia), Learning machines, Problem solving, Information theory, Data processing systems, Documentation, Bionics

Part 1 of this paper deals with abstract, cybernetic, models for the data processing activities of organisms. In such a model, an organism is regarded as reducible to minimal components that are active control systems. Several hypotheses are posed in the course of the discussion. Part 2 of the paper describes the relevant features of some experiments in the field of man-machine interaction and provides data in support of these hypotheses. (Author)

**AD-628 706 Fld. 6/4, 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*INFORMATION RESEARCH ASSOCIATES INC CAMBRIDGE MASS*
**NON-PARAMETRIC PATTERN RECOGNITION. PART I. THE LOCALLY DISJOINT CASE.**
Technical rept.,
by Joel Owen. 1 Jul 65, 22p. Rept. no. TR-1,IRA-100:1-Pt-1
Contract Nonr-4752 (00), Proj. NR-348-010,
Unclassified report

See also AD-628 707.

Descriptors: (*Pattern recognition, Decision theory), Transformations (Mathematics), Probability, Distribution theory, Statistical analysis, Learning machines, Learning, Automata, Bionics, Information theory

The validity of the decision theoretic approach to pattern recognition depends primarily on the assumptions of the unknown underlying probability distribution. Here a mathematically rigorous procedure is developed which transforms the underlying unknown probability structure and then partitions the space by nonparametric techniques. In particular, the procedure transforms the learned samples to the real line using a functional which is dependent on estimates obtained from the learned samples. Treating these transformed one-dimensional random variables in terms of cumulative distribution, the underlying probability space is then partitioned by the fact that the location of the extrema of the difference or cumulative functions will converge to the boundaries of the likelihood decision rule. The decision rule which essentially defines this procedure is dependent on the location of the extrema. Moreover, this decision will provide perfect discrimination between category j and k for some finite learning phase if j and k are locally separate or disjoint. (Author)

**AD-628 707 Fld. 6/4, 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*INFORMATION RESEARCH ASSOCIATES INC CAMBRIDGE MASS*
**NON-PARAMETRIC PATTERN RECOGNITION. PART II. THE NON-DISJOINT CASE.**
Technical rept.,
by Joel Owen. 1 Oct 65, 13p. Rept. no. TR-2,IRA-100:5-Pt-2
Contract Nonr-4752 (00), Proj. NR-348-010,
Unclassified report

Descriptors: (*Pattern recognition, Decision theory), Transormations (Mathematics), Probability, Distribution theory, Statistical analysis, Learning machines, Learning, Automata, Bionics, Information theory

In Part I of this paper (AD-628 706), a non-parametric discrimination technique was proposed. It was shown that when perfect discrimination was possible, this technique achieved this perfection and in certain cases achieved it with a finite learning phase. In this report, properties of this technique are investigated for the case when perfect discrimination is not possible. In particular, it is shown that even under these conditions asymptotic optimality in the risk sense is attained. (Author)

**AD-628 708 Fld. 6/4, 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*INFORMATION RESEARCH ASSOCIATES INC CAMBRIDGE MASS*
**A SCHEME FOR LINEAR RECOGNITION BASED ON SELF-DETERMINED INTER-CATEGORY FEATURES.**
Technical note,
by Joel Owen. 15 Jul 65, 12p. Rept. no. TN-1,IRA-100:2
Contract Nonr-4752 (00), Proj. NR-348-010,
Unclassified report

Descriptors: (*Pattern recognition, Decision theory), Probability, Statistical analysis, Distribution theory, Bionics

In a pattern recognition problem, where observations are described by a mxn grid, it is often the case that each pattern is reduced to a 'mask' and discrimination is performed by comparing an unknown to each mask. Assignment is then determined by the closest mask. This paper discusses a preprocessing technique for feature extraction to reduce the size of the masks or to extract those mask sub-areas most pertinent for recognition. Statistical tests are applied to determine uncommon regions (i.e., differences) between masks. All subsequent recognition is based on and emphasizes these uncommon regions (as distinguishing features). The resulting weights of this method are controlled by differences between the groups and thus cannot be separated into a characteristic set of weights from each individual group. Moreover, this method provides the freedom to elect the level of closeness that the categories must satisfy. (Author)

**AD-628 709 Fld. 6/4, 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*INFORMATION RESEARCH ASSOCIATES INC CAMBRIDGE MASS*
**TWO CLASSES OF NON-PARAMETRIC TECHNIQUES FOR PATTERN RECOGNITION AND THEIR ERROR ANALYSIS.**
Technical note,
by Joel Owen. 1 Sep 65, 23p. Rept. no. TN-2,IRA-100:4
Contract Nonr-4752 (00), Proj. NR-348-010,
Unclassified report

Descriptors: (*Pattern recognition, Decision theory), Probability, Distribution theory, Statistical analysis, Learning, Information theory, Learning machines, Automata, Bionics, Errors

Another criterion is added to handle the case when distributional information is lacking. This criterion is to approximate the Bayes Solution based only on the statistics acquired during the learning phase. This criterion approaches the optimum risk decision as the learning phase is increased. Two classes of nonparametric techniques are proposed. Corresponding error analyses for these two techniques are made in order to determine how much is lost by using sub-optimal (i.e., a finite learning phase) decisions. (Author)

**AD-628 710 Fld. 6/4, 12/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*INFORMATION RESEARCH ASSOCIATES INC CAMBRIDGE MASS*
**THE CONSISTENCY OF A NON-PARAMETRIC DECISION PROCEDURE.**
Technical note,
by Joel Owen. 1 Sep 65, 18p. Rept. no. TN-3,IRA-100:6
Contract Nonr-4752 (00), Proj. NR-348-010,
Unclassified report

Descriptors: (*Pattern recognition, Decision theory), (*Decision theory, Pattern recognition), Probability, Distribution theory, Statistical analysis, Learning, Automata, Bionics

It has been suggested that if a discriminating procedure is to adapt to an environment, it must not be limited by erroneous assumptions concerning the unknown distributions or functional form for the discriminator. This technical note displays mathematically the analogy between the notion of learning and the concept of consistency originally defined for parameter estimation. Moreover, some information concerning limiting behavior is deduced. (Author)

**AD-628 873 Fld. 6/4**
**CFSTI Prices: HC $6.00 MF $1.25**
*SYLVANIA ELECTRONIC SYSTEMS WALTHAM MASS APPLIED RESEARCH LAB*
**A THEORETICAL MODEL FOR COLOR VISION.**
Final rept. May 63-Apr 65,
by George Biernson, and Allen Snyder. Dec 65, 233p. Rept. no. F-3052-2,
Contract AF 33 (657)-11717, Proj. AF-7232, Task 723205,
AMRL TR-65-193
Unclassified report

Descriptors: (*Color vision, Model theory), (*Model theory, Color vision), Bionics, Colorimetry

This report covers the development of a model of color vision based on feedback control principles, which provides an explanation for the wide dynamic range, high accuracy of spectral discrimination, and invariance to changing illumination that we experience in color vision. The model is consistent with physiological and psychological evidence. Analysis is presented of waveguide modes in the retinal receptors which are assumed to be the means of spectral discrimination. (Author)

**AD-628 055 See Fld. 17/1**

**AD-628 564 See Fld. 5/8**

## 6/5. CLINICAL MEDICINE

**AD-628 123 Fld. 6/5**
*NAVAL MEDICAL FIELD RESEARCH LAB CAMP LEJEUNE N C*
**CHANGES IN BLOOD COAGULABILITY IN DOGS FOLLOWING FLASH BURNS.**
Interim rept.,
by I. Dodd Wilson, Dean R. Taylor, and Thomas C. Nicholson. Feb 66, 11p. Rept. no. vol. 16/No. 1, NAVMED MR005.12-7020.1.9
Unclassified report

*Availability: Published in The Journal of Trauma v5 n6 p775-81 1965. Copies to DDC users only.*

Descriptors: (*Burns, Blood coagulation), (*Blood coagulation, Pathology), Fibrinogen, Prothrombin, Dogs

A controlled study of blood coagulability after burns in dogs revealed an elevation of the plasma fibrinogen, prolongation of the partial thromboplastin time and Lee-White siliconed clotting times, and decreased fibrinolytic activity occurring between 12 and 96 hours after burn. No significant changes were noted in the thrombocyte count or prothrombin time and no evidence for a period of hypercoagulability was found. It was concluded that the changes developed too late to explain previous experimental observations and that the study of the relationship of blood coagulability to specific problems, rather than as a general phenomenon, might be more profitable. (Author)

**AD-628 124 Fld. 6/5**
*NAVAL MEDICAL FIELD RESEARCH LAB CAMP LEJEUNE N C*
**EVALUATION OF CONVALESCENT BURN SERUM AS A TREATMENT FOR BURNED INBRED BEAGLE DOGS.**
Interim rept.,
by I. Dodd Wilson. 17 Mar 65, 9p. Rept. no. Vol. 16/No. 2,
NAVMED MR005.12-7020.1.10
Unclassified report

*Availability: Published in The Journal of Surgical Research, v5 n10 p443-47 Oct 1965. Copies to DDC users only.*

Descriptors: (*Burns, Blood transfusions), (*Blood transfusions, Immunity), Therapy, Dogs, Toxicity, Blood serum

Recent work has suggested that the use of serum from patients convalescing from burns is beneficial when administered to acutely burned patients. From the military aspect, where mass casualties can be expected, any simple treatment reducing the severity of the burn syndrome would be advantageous. A controlled, doubleblind study of the effects of convalescent burn serum on burned inbred beagle dogs is reported. All results obtained are statistically non-significant. These data fail to support either the burn toxin concept or the validity of immunotransfusion in the treatment of burns. (Author)

**AD-628 152 Fld. 6/5**
*NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)*
**PRELIMINARY REPORT ON ABNORMAL HEMOGLOBINS IN FILIPINOS,**
by R. Quentin Blackwell, Victorino de la Fuente, Rodolfo F. Florentino, Leon G. Alejo, and Jeanette Tung-Hsiang Huang. Oct 65, 8p. Rept. no. 13 ,NAMRU-2-TR-225
NAVMED MF022.03.07.2004.13
Unclassified report

*Availability: Published in The Journal of the Philippine Medical Association v41 n10 p703-6 Oct 1965. Copies to DDC users only.*

Descriptors: (*Hemoglobin, Philippines), Electrophoresis, Distribution, Population

Blood samples from 2563 presumably healthy normal Filipinos were examined by starch gel electrophoresis with TRIS-EDTA-borate buffer at pH9.0. Among 1709 blood samples collected from subjects in Luzon, 10, or 0.6%, were found to have hemoglobins A + E and one was found to have hemoglobins A + G. Twelve among 854 subjects, 1.4%, from the Western Visayas region of the country also had A + E hemoglobins. Four of the 191 family groups, 2.1%, from the latter region included individuals with A + E hemoglobins. These results suggest that the incidence of individuals with A + E hemoglobins may be higher in the Western Visayas region than in some other regions of the country. Further studies are in progress to investigate the possibility of such regional variations. (Author)

**AD-628 238 Fld. 6/5**
*ARMED FORCES INST OF PATHOLOGY WASHINGTON D C*
**ANO-RECTAL MELANOMA,**
by J. K. Mason, and Elson B. Helwig. 28 May 65, 12p.
Unclassified report

*Availability: Published in Cancer v19 n1 p39-50 Jan 1966. Copies to DDC users only.*

Descriptors: (*Cancer, Histology), Diagnosis, Biopsy, Pathology, Tissues (Biology), Intestines, Medical examination, Organic pigments, Histological techniques

The incidence of melanoma of the ano-rectum is discussed and the authors introduce 17 cases from the records of the Armed Forces Institute of Pathology. The anatomy of the ano-rectum is described and some features which lead to difficulties are discussed. Of particular interest are the intermingling of squamous and columnar epithelium in the area and the problems of definition of the anal boundaries. Reasons are given for regarding only 2 of the 17 cases as truly rectal. Clinical details confirm the poor prognosis of this condition; the mean survival of the patients was 15 months. Pathologically, the most common finding was of separated tumors of the squamous and columnar mucosae, often with intervening satellite lesions of the mucosa or submucosa. Seven tumors showed junction change at the squamous mucous membrane. Theories of the histogenesis of melanoma in general are discussed and applied to the material under review. The authors conclude that it is probable that most melanomas of the ano-rectum are primary in the anus with involvement of the rectum by direct or metastitic extension. (Author)

**AD-628 254 Fld. 6/5**
*FLORIDA UNIV GAINESVILLE COLL OF MEDICINE*
**SLEEP PATTERNS IN YOUNG ADULTS: AN EEG STUDY,**
by Robert L. Williams, Harman W. Agnew Jr., and Wilse B. Webb. 7 Feb 64, 7p. Contract AF-AFOSR-62-13,
AFOSR 65-2681
Unclassified report

*Availability: Published in Electroencephalography and Clinical Neurophysiology v17 p376-81 1964. Copies to DDC users only.*

Descriptors: (*Sleep, Electroencephalography), Males, Adults, Analysis of variance

EEG sleep stages do not appear in any consistent temporal sequence from night to night in a given subject nor in a group of subjects. The typical young adult in our study spent an individually characteristic relative amount of time in each sleep stage each night. The length of stages was short, usually less than 10 min, with the exception of stage 1-REM which ranged up to 39 min in length. Our subjects characteristically changed stages fewer times on successive nights. The number of sleep stage changes differed among subjects. The stage change was usually smooth, moving from one stage to the next when sleep was deepening, but less smooth, often 'jumping' more than a stage during arousal from deeper levels. The EEG sleep stages were found to be most prevalent in certain thirds of the night. The greatest amounts of stages 4 and 3 were found in the first third, 1-REM in the last third of the night. Stage 2 is more evenly distributed throughout the night. (Author)

**AD-628 318 Fld. 6/5**
**CFSTI Prices: HC $1.10 MF $0.50**
*UTAH UNIV SALT LAKE CITY*
**FINAL REPORT,**
by Richard B. Gresham. 18 Feb 66, 2p. Contract Nonr (G)-00068-65,
Unclassified report

Descriptors: (*Bone, Transplantation), (*Transplantation, Bone), Guinea pigs, Biological assay

**AD-628 371 Fld. 6/5, 5/10**
*LANGLEY PORTER NEUROPSYCHIATRIC INST SAN FRANCISCO CALIF*
**THE AUDITORY EVOKED RESPONSE AS A DIAGNOSTIC AND PROGNOSTIC MEASURE IN SCHIZOPHRENIA,**
by Reese T. Jones, K. H. Blacker, Enoch Callaway, III, and Robert S. Layne. 1965, 9p. Contract Nonr-2931 (00),
Unclassified report

Prepared for presentation at Annual Meeting (121st) of American Psychiatric Association, New York, N. Y. 3-7 May 65. Prepared in cooperation with Calif. Univ., Berkeley. School of Medicine.

*Availability: Published in American Journal of Psychiatry, v122 n1 p33-41 Jul 1965. Copies to DDC users only.*

Descriptors: (*Psychoses, Auditory perception), (*Mental disorders, Diagnosis), Psychiatry, Electroencephalography, Audiofrequency

Schizophrenic and nonschizophrenic mental patients can be distinguished by differences in the correlation between pairs of averaged evoked responses (AER) to tones of 600 cps and to tones of 1,000 cps recorded from scalp electroencephalographs. This two-tone AER effect was predicted from Shakow's segmental set theory. Schizophrenics preoccupied with ordinarily disregarded details place more value on the physical difference between two tones when no symbolic significance has been assigned and the evoked responses are more dissimilar. Clinical improvement in the schizophrenic patients was associated with a shift in the two-tone AER toward values seen in nonschizophrenics. No such change was found in nonschizophrenic patients. The clinically improved schizophrenics also demonstrated an increased amplitude of evoked response. The use of the measure as a diagnostic and prognostic technique is discussed. (Author)

**AD-628 384 Fld. 6/5, 6/13, 6/15**
**CFSTI Prices: HC $5.60 MF $0.50**
*NAVAL MEDICAL RESEARCH UNIT NO 4 GREAT LAKES ILL*
**1965 RESEARCH CLERKSHIP REPORTS,**
by Burton H. Greenberg. Jan 66, 53p.
Unclassified report

Descriptors: (*Military medicine, Immunology), (*Immunology, Military medicine), (*Medical research, Navy), Variola viruses, Vaccines, Skin, Serodiagnosis, Resistance (Biological), Sulfadiazine, Neisseria meningitidis, Mycoplasma, Pleuropneumoia-like organisms, Respiratory diseases, Adenoviruses, Antigens + antibodies, pH, Ions, Hemolysis, Complement, Military personnel

Relationship of Skin Reactions and Serological Response Following Smallpox Vaccination, by James E. Berner and Edward R. Villella; Sulfadazine-resistant Neisseria Meningitidis, by Charles S. Brook; Surveillance of Mycoplasma Flora in Seasoned Troops, by J. W. Carlisle and R. E. Redmond; Possible Role of Autoantibodies in Adenovirus Disease, by Richard W. Gorski; Comparison of Physical Methods for the Growth and Disintegration of Neisseria Meningitidis for Antigenic Preparation, by Michael W. Pekas; Effect of pH and Ionic Strength on the Hemolytic Properties of Complement, by Patrick G. Sullivan.

**AD-628 477 Fld. 6/5**
*ARMED FORCES INST OF PATHOLOGY WASHINGTON D C*
**THE ASSOCIATION OF HYPERTHYROIDISM AND THYROID CANCER,**
by E. Olen, and G. H. Klinck. 1965, 3p.
Unclassified report

*Availability: Published in Current Topics in Thyroid Research. Proceedings of the International Thyroid Conference (5th) p1023-5 1965. Copies to DDC users only.*

Descriptors: (*Thyroid gland, Diseases), (*Cancer, Thyroid gland), Etiology, Pathology, Statistical data

**AD-628 478 Fld. 6/5**
*GEORGE WASHINGTON UNIV WASHINGTON D C*
**OBSERVATIONS ON EARLY PATHOLOGIC EFFECTS OF PHOTIC INJURY TO THE RABBIT RETINA. A LIGHT AND ELECTRON MICROSCOPIC STUDY,**
by Ben S. Fine, and Walter J. Geeraets. 11 Apr 65, 23p. Contract DA-49-193-md-2680 ,DA-49-146-XZ-102
Unclassified report

Prepared in cooperation with Armed Forces Inst. of Pathology, Washington, D. C. Ophthalmic Branch and Medical Coll. of Virginia. Depts. of Ophthalmology and Biophysics, Richmond.

*Availability: Published in Acta Ophthalmologica v43 p684-91 1965. Copies to DDC users only.*

Descriptors: (*Retina, Pathology), Light, Wounds + injuries, Xenon lamps, Lasers, Photoreceptors, Eye, Hazards, Radiation injuries, Organic pigments, Tissues (Biology), Microscopy, Electron microscopy, Thresholds (Physiology), Morphology (Biology), Ophthalmology, Rabbits

Mild retinal lesions, 5 hours old, produced by a pulsed xenonlamp photocoagulator and by a ruby rod laser were compared by light and electron microscopy. The physical parameters of exposure time, diameter of the beam at the retinal plane, and retinal dose were very similar for both methods. The observations indicate that the site of earliest tissue change lies within the pigment epithelial cell, more specifically in the fragile system of smooth-surfaced endoplasmic reticulum occupying the apical and midzonal cytoplasm. In more severe lesions, a nonspecific granulation effect was observed in the pigment epithelium and photoreceptor cells attributed to focal densification of cell membranes and of the adjacent cytoplasmic ground substance. Morphologic evidence is presented indicating absence of trans-synaptic degeneration from the photoreceptor cells within the limited time interval (5 hr.) of the experiments. The observations also support the belief that the intracellular changes are nonspecific, varying only in degree of severity. (Author)

**AD-628 479 Fld. 6/5**
*ARMED FORCES INST OF PATHOLOGY WASHINGTON D C*
**AMYLOIDOSIS OF THE EYELID AND CONJUNTIVA,**
by Morton E. Smith, and Lorenz E. Zimmerman. 10 May 65, 15p. Contract PHS-3 T1 NB-5379-03S1,
Unclassified report

*Availability: Published in Archives of Ophthalmology v75 p42-56 Jan 1966. Copies to DDC users only.*

Descriptors: (*Eye, Metabolism disorders), (*Metabolism disorders, Eye), Pathology, Histology, Membranes (Biology)

Seventeen cases of localized amyloidosis of the lids and conjunctiva were reviewed and re-evaluated histopathologically.

**AD-628 556 Fld. 6/5**
*NAVAL MEDICAL RESEARCH UNIT NO 4 GREAT LAKES ILL*
**EPIDEMIOLOGY AND PREVENTION OF ACUTE RESPIRATORY DISEASE IN NAVAL RECRUITS,**
by Max J. Rosenbaum, Earl A. Edwards, Paul F. Frank, Willard E. Pierce, and York E. Crawford. Jan 65, 47p.
NAVMED MR005.09-1203.16-Pt-1
Unclassified report

*Availability: Published in American Journal of Public Health, v55 n1 p38-80 Jan 1965. Copies to DDC users only.*

Descriptors: (*Respiratory diseases, Naval personnel), Epidemiology, Adenoviruses, Influenza virus, Streptococcus, Serodiagnosis, Immunity, Penicillins, Vaccines, Diplococcus, Diseases, Antigens + antibodies, Mycoplasma, Pleuropnemonia-like organisms, Body temperature, Fevers, Naval shore establishments, Marine Corps, Military medicine, Naval training

Contents: Ten years' experience with microbial agents isolated from naval recruits with acute respiratory disease; Efficacy of adjuvant and aqueous adenovirus vaccines in prevention of naval recruit respiratory disease; Effect of delayed immunizations on acute respiratory disease in Navy recruits; Epidemiologic study of respiratory illness patterns in Navy and Marine Corps recruits.

**AD-628 595 Fld. 6/5, 5/10**
*SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX*
**THE NEUROTIC COMPONENT OF NARCOLEPSY,**
by Alan L. Morgenstern. 1963, 10p. Rept. no. SAM-TR-65-319,
Unclassified report

*Availability: Published in The American Journal of Psychiatry, v122 n3 p306-12 Sep 1965. Copies to DDC users only.*

Descriptors: (*Neuroses, Sleep), (*Sex, Neuroses), Abnormal psychology, Anxiety, Behavior, Psychiatry, Motor reactions, Medical examination

The psychogenic fraction of narcolepsy is centered about unacceptable impulses and defenses they provoke. In cataplexy episodes, sexual and aggressive actions and fantasies are blocked on a neuromuscular level. A sleep attack is far more complicated and some aspects may be compared to a classical psychoneurosis because the symptom provides not only defense but simultaneous disguised gratification of a wish. A 30-year-old aviator with narcolepsy was found to have an hysterical character disorder. The case is discussed in detail and psychological test data are presented. An abnormal nocturnal EEG typical of narcolepsy was obtained. The patient had the rare symptom of cataplexy at orgasm and abnormalities in the sexual life of narcoleptics are discussed. (Author)

**AD-628 619 Fld. 6/5, 6/13**
*JOHNS HOPKINS UNIV BALTIMORE MD SCHOOL OF HYGIENE AND PUBLIC HEALTH*
**HISTOLOGICAL STUDIES OF THE MONKEY NEUROVIRULENCE OF GROUP B ARBOVIRUSES. I. A SEMIQUANTITATIVE GRADING SCALE,**
by Neal Nathanson, David Goldblatt, Inderjit S. Thind, Miles Davis, and Winston H. Price. 3 Aug 65, 24p. Contract DA-49-193-md-2398, PHS-NB-05363
Unclassified report

*Availability: Published in American Journal of Epidemiology v82 n3 p359-81 1966. Copies to DDC users only.*

Descriptors: (*Monkeys, Arboviruses), (*Arboviruses, Central nervous system), (*Central nervous system, Histology), Dengue, Japanese B encephalitis virus, Nuclei (Biology), Injection (Medicine), Spinal cord, Brain, Viability, Pathology

The report is the first in a series of studies undertaken to develop standardized procedures for the quantitative evaluation of the monkey neurovirulence of group B arboviruses, based on the severity of histologic lesions in the central nervous system. A total of 16 monkeys were inoculated intracerebrally with control fluid, dengue 4, Langat, and Japanese encephalitis viruses, using 4 monkeys per group. Monkeys were killed after 30 days and 10 histologic sections examined from each of 3 CNS blocks (cerebral hemispheres, pons and cervical spinal cord). Individual nuclei and tracts (25 in hemispheres, 25 in brainstem and 5 in cord) were graded using a semiquantitative scale ranging from 0 (normal) to 4 (overwhelming lesions).

**AD-628 723 Fld. 6/5**
*BAYLOR UNIV HOUSTON TEX COLL OF MEDICINE*
**INFLUENCE OF AUTOLOGOUS AND HOMOLOGOUS BLOOD EXCHANGE ON THE BLEEDING VOLUME OF DOGS,**
by S. Deavers, R. A. Huggins, and E. L. Smith.
21 Jun 65, 7p. Contract DA-49-193-md-2357, PHS-HE-08793.02
Unclassified report

*Availability: Published in American Journal of Physiology, v210 n1 p146-50 Jan 1966. Copies to DDC users only.*

Descriptors: (*Blood transfusions, Blood volume), (*Hemorrhage, Blood transfusions), Dextran, Blood pressure, Hematocrit, Erythrocytes, Blood plasma, Blood circulation, Blood proteins, Hypotension, Dogs

Three groups of anestetized dogs were given an exchange transfusion of 500 ml of either autologous or homologous blood or dextran. The exchange was accomplished with an average decrease of only 5 mm Hg arterial pressure. With the exception of a significant increase in venous hematocrits, measured and calculated red cell and plasma volumes, BVR cells (circulatory hematocrit/venous hematocrit), and protein concentration were in good agreement. When these dogs were bled to a mean arterial pressure of 35 mm Hg, the mean bleeding volume was significantly less (autologous 34%; homologous 26%) than for a control group (49%). Fluid and protein recovery after hemorrhage was absent in the exchange dogs; measured plasma volume and protein concentration were less than expected. Exchange of dextran for the dogs' own blood resulted in larger cell and plasma volumes than expected, but the response to hemorrhage was similar to that of the blood exchange groups, with a bleeding volume of 36% and a loss of fluid after hemorrhage. The blood remaining in the circulation after hemorrhage was approximately the same for control and exchange dogs, representing 61-68% of their control blood volume. (Author)

**AD-628 735 Fld. 6/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*WALTER REED ARMY INST OF RESEARCH WASHINGTON D C*
**PRINCIPLES AND TECHNIQUES IN ARMY MENTAL HYGIENE CONSULTATION,**
by William E. Datel. 1964, 16p.
Unclassified report

Prepared for presentation at a conference entitled Current Trends in Social and Preventive Psychiatry sponsored by the Office of the Surgeon General, Headquarters, Department of the Army, Washington, D. C., January 1964.

Descriptors: (*Psychiatry, Army personnel), (*Medical personnel, Job analysis), Social communication, Attitudes

**AD-628 751 Fld. 6/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX*
**A HISTORICAL REVIEW OF THE BUBBLE THEORY OF THE ETIOLOGY OF DECOMPRESSION SICKNESS AS RELATED TO HIGH ALTITUDE EXPOSURE.**
Aeromedical Reviews,
by Harold R. Andersen. Dec 65, 44p. Rept. no. AR-1065,
Proj. AF-7758, Task 775801,
SAM TR-65-85
Unclassified report

Descriptors: (*Decompression sickness, State-of -the-art reviews), Etiology, High altitude, Adaptation (Physiology), Response, Pressure, Gases, Tissues (Biology), Classification

There was a need for a comprehensive historical review of decompression sickness and related subjects such as the bubble theory, denitrogenation, over -compression, and pertinent terminology. A simplified classification scheme is introduced which retains the currently popular term decompression sickness to describe those symptoms which arise owing to the response of the body to reduction of pressure, in accordance with Henry's law. A new term, mechanicobaropathy, is introduced to describe any symptom or disease which arises owing to the mechanical effects on body tissues of the response of gases to Boyle's law. Highlights of the literature on decompression sickness, from 1670 to 1965, are presented. (Author)

**AD-628 752 Fld. 6/5, 5/10**
*NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF*
**ECCRINE SWEAT GLAND ACTIVITY AND RACIAL DIFFERENCES IN RESTING SKIN CONDUCTANCE,**
by Laverne C. Johnson, and Marvin M. Landon.
1964, 9p. Rept. no. 64-26,
NAVMED MR005 12.2304
Unclassified report

*Availability: Published in Psychophysiology v1 n4 p322-9 Apr 1965. Copies to DDC users only.*

Descriptors: (*Sweat glands, Galvanic skin response), Electrophysiology, Pulse rate, Respiration, Blood pressure, Body temperature, Psychophysiology

Active eccrine sweat gland activity was measured in 30 Negro and 29 Caucasian male subjects to determine whether sweat gland activity was a possible factor in racial differences in skin conductance. Basal skin conductance, heart rate, respiratory rate, finger skin temperature and blood pressure were also obtained. Negro Ss had significantly lower skin conductance but no other significant physiological differences were found. While there was no significant difference in number of active sweat glands between the races, the intragroup relationship between sweat gland count and skin conductance was significantly higher for the Negro Ss. The two groups did not differ in number of nonspecific galvanic skin responses (GSRs) but the Caucasian Ss showed greater change in skin conductance to an initial tone stimulus. When differences in prestimulus levels were taken into account, the group differences in response to stimuli were no longer significant. (Author)

**AD-628 755 Fld. 6/5**
*NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF*
**DEPRESSION IN THE OFFICER PATIENT,**
by Robert P. Yanko, David J. Schwartz, and Ransom J. Arthur. 1965, 9p. Rept. no. 65-30,
Unclassified report

Prepared in cooperation with the Neuropsychiatric Service, U. S. Naval Hospital, Oakland, Calif.

*Availability: Published in The American Journal of Psychotherapy v19 n4 p585-92 Oct 1965. Copies to DDC users only.*

Descriptors: (*Officer personnel, Psychiatry), (*Psychiatry, Naval personnel), Emotions, Attitudes, Personality, Neurology

The purpose of the paper is to examine a specific depressive reaction noted in the naval-officer neuropsychiatric patient who, despite an apparently outstanding service record, failed to receive an expected or hoped-for promotion.

**AD-628 756 Fld. 6/5**
*NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF*
**THE NAVAL MEDICAL OFFICER AS A PSYCHIATRIC PATIENT,**
by Ransom J. Arthur. 1965, 7p. Rept. no. 65-9,
NAVMED MR005.12.2004-2
Unclassified report

*Availability: Published in The American Journal of Psychiatry v122 n3 p290-94 Sep 1965. Copies to DDC users only.*

Descriptors: (*Medical personnel, Psychiatry), (*Officer personnel, Psychiatry), (*Psychiatry, Naval personnel), Neurology, Emotions, Medical examination

A detailed examination was made of the records of all medical officers hospitalized in naval hospitals for those disorders during the three calendar years of 1960 through 1962. Forth-two out of 44 records were available and were utilized. In addition to the analysis of the cases, certain follow-up data were obtained on those officers remaining in the service as of January 1, 1964.

**AD-628 757 Fld. 6/5**
*NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF*
**SUBEPENDYMAL CEREBRAL HEMORRHAGE IN INFANCY,**
by John J. Ross, and Robert M. Dimmette. 19 Apr 65, 14p. Rept. no. 65-12,
Unclassified report

Supported in part by Bureau of Medicine and Surgery.

*Availability: Published in American Journal of Diseases of Children v110 p531-42 Nov 1965. Copies to DDC users only.*

Descriptors: (*Infants, Hemorrhage), (*Hemorrhage, Brain), Pathology, Pregnancy, Birth, Anoxia, Etiology, Histology

A comprehensive description of the clinicopathologic findings of 30 infants with subependymal cerebral bleeding was made. The data showed that subependymal cerebral hemorrhage with intraventricular rupture is an occult pathologic response in premature infants to a combination of complications during pregnancy, at delivery, and after birth that produce anoxia and trauma to the infant, of which anoxia appears to be the most important. By postmortem examination the subependymal hemmorrhages appeared to originate in the external half of the subependymal matrix from the transverse caudate veins or their tributaries, and they occurred over the head and tail of the caudate nucleus, in the anterior portion of the stria terminalis, and, rarely, in the walls of the occipital or temporal horns of the lateral ventricle. Contrary to general belief, histologic examination revealed a cellular reaction to the bleeding in some babies. One infant that survived 21 days developed internal obstructive hydrocephalus with ventriculitis and arachnoiditis. Support for the concept that the 'zonae pallidae' represent a predisposing developmental factor for bleeding into the subependyma is presented. (Author)

**AD-628 763 Fld. 6/5**
**CFSTI Prices: HC $3.00 MF $0.75**
*AEROSPACE MEDICAL DIV AIR FORCE SYSTEMS COMMAND BROOKS AFB TEX*

**FOREIGN DEVELOPMENTS IN SURGICAL TRANSPLANTATION,**
Foreign technology rept.,
by Howard S. Friedman. Mar 66, 68p. Rept. no. AMD-CR-01-1-66, TT 66-60637

Unclassified report

Descriptors: (*Transplantation, Surgical techniques), Medical research, Medical personnel, Immunology, Pathology, State-of-the-art reviews, Skin, Blood vessels, Neoplasms, Tendons, Cartilage, Muscles, Bone, Bone marrow, Endocrine glands, Heart, Lungs, Kidneys, Intestines, Extremities, Surgical supplies, Bibliographies, USSR

A brief history of surgical transplantation in general, and of Soviet activities in this area in particular, is presented. Surgical practice and research facilities and major personalities of the Soviet Union are outlined. Soviet activities and research are discussed in reference to the transplantation of: skin; tumor transplants, fasciae; tendons; cartilage; muscle; bone and bone marrow; endocrine glands; heart, lung, kidney, intestine, and other organs; and the extremities. Biochemical, pathologic, and immunobiologic aspects are included in the discussion. A current state-of-the-art in the Soviet Union is projected. (Author)

**AD-628 857 Fld. 6/5**
**CFSTI Prices: HC $3.00 MF $0.75**
*WESTERN RESERVE UNIV CLEVELAND OHIO SCHOOL OF MEDICINE*
**STUDIES OF THE IMMUNOLOGICAL FACTORS INVOLVED IN HOMOLOGOUS TISSUE TRANSPLANTATION.**
Annual rept., 1 Mar 65-28 Feb 66,
by Charles A. Hubay. 28 Feb 66, 81p. Contract DA-49-007-MD-961,

Unclassified report

Descriptors: (*Immunology, Transplantation), (*Transplantation, Immunology), Tissues (Biology), Amino acids, Leukocytes, Tissue culture cells, Tritiated compounds, Thymidines, Pathology, In vitro analysis, Labeled substances, Antigens + antibodies, Allergy, Lymphatic system, Bone marrow, Skin, Gamma globulin, Guinea pigs, Rats

A symbolic representation of amino acid sidechains is suggested which emphasizes the distribution of sites for weak intermolecular interactions. A routine has been established for the examination of cultures of leukocytes from different individuals. As has been shown elsewhere, mixed cultures show a stimulated incorporation of tritiated thymidine. The system will be used to study the matching problem in the selection of donors of transplanted tissues. Conditions have been established for the in vitro labeling of rat peripheral leukocytes with tritiated leucine. The label was confined to the protein fraction of the cells. The combining site -containing fragment of rabbit antibody has been treated with dinitrofluorobenzene. The combining site-containing fragment of rabbit antibody has been treated with dinitrofluorobenzene. The sulfhydryl groups and the amino groups are substituted and may be determined in the presence of each other by a spectro-photometric method. Experiments are outlined for the degradation of the derivative into peptides in order to partially test a theory in which heterogeneity of antibody is said to be an absolute requirement for specificity. The rate of disappearance from a skin site of a labeled antigen in delayed hypersensitive animals was ascertained. In a group of animals displaying Arthus sensitivity, the specific antigen was removed at an accelerated rate.

**AD-628 047 See Fld. 6/12**

**AD-628 105 See Fld. 6/6**

**AD-628 106 See Fld. 6/3**

**AD-628 125 See Fld. 6/13**

**AD-628 126 See Fld. 6/13**

**AD-628 243 See Fld. 5/10**

**AD-628 263 See Fld. 6/1**

**AD-628 462 See Fld. 6/16**

**AD-628 666 See Fld. 6/13**

**AD-628 713 See Fld. 6/14**

**AD-628 754 See Fld. 5/9**

**AD-628 804 See Fld. 6/16**

## 6/6. ENVIRONMENTAL BIOLOGY

**AD-628 105 Fld. 6/6, 6/3, 6/5**
**CFSTI Prices: HC $14.60 MF $1.00**
*PACAF EPIDEMIOLOGICAL LAB SAN FRANCISCO CALIF 96274 EPIDEMIOLOGICAL FLIGHT (5TH)*
**STUDIES OF THE ECOLOGY OF CLARK AB, CENTRAL LUZON, R. P. II. A COMPREHENSIVE MOSQUITO SURVEY.**
Technical rept.,
by F. H. Dowell, J. L. Libay, and F. E. Baisas. Dec 65, 146p. Rept. no. TR-15-65,

Unclassified report

Descriptors: (*Disease vectors, Culicidae), (*Culicidae, Ecology), (*Ecology, Philippines), Collecting methods, Virus diseases, Military facilities

Approximately 60 - 65 species of mosquitoes are present on Clark AB in any given year. However, there are marked changes from year to year in the composition of this group of species, probably as a result of variations in rainfall. Because of climatic variation from year to year, surveys should last at least five years. Investigation of the relationship between chance and microclimatology in discontinuous breeding and resting areas should be pursued. Some factor other than chance appears to be involved. There is both a practical and theoretical necessity for using a broad range of collection methods in a survey. Even though a species is zoophilic, very large populations may pose a threat to man because the small fraction that bites man may be large numerically. C. tritaeniorhynchus summorosus is the most important species of mosquito on Clark AB. Satisfactory methods for pooling mosquitoes for virus isolation have been developed using a power aspirator for collection and a carbon dioxide stage for sorting.

**AD-628 177 Fld. 6/6**
*NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)*
**ZOOPHILIC SCHISTOSOMIASIS ON TAIWAN: REESTABLISHMENT OF SCHISTOSOMA JAPONICUM SUBSEQUENT TO DRASTIC ALTERATION OF HABITATS BY FLOOD,**
by Robert E. Kuntz. 29 Mar 65, 7p. Rept. no. NAMRU-2-TR-224, NAVMED MF022.03.07-2003.24

Unclassified report

*Availability: Published in The Journal of Parasitology v51 n5 p747-9 Oct 1965. Copies to DDC users only.*

Descriptors: (*Schistosoma, Taiwan), Parasites, Ecology, Distribution, Floods, Pest control, Gastropoda, Life cycle

Drastic alterations in the habitats of Schistosoma japonicum in the enzootic area of Taiwan practically eliminated the parasite in the focus studied. Observations over a period of several years allowed a comparison of the status of host-parasite relationships before and after interruption of the parasite cycle by natural causes. Although excessive flooding reduced the snail (Oncomelania formosana) population and the parasite infection in definitive hosts (lower vertebrates) to near nil, Oncomelania populations returned to near normal after approximately 1 year, followed by appearance of infection in rodents. An unusual compensation in biological productivity seemed to allow for rapid reestablishment of the schistosome cycle after abnormal circumstances had placed the parasite-snail-definitive host associations in jeopardy. (Author)

**AD-628 294 Fld. 6/6, 2/1, 6/15, 6/13, +**
**CFSTI Prices: HC $3.00 MF $0.75**
*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*
**CBE FACTORS: MONTHLY SURVEY NO. 1.**
ATD work assignment no. 50.
1966, 71p. Rept. no. atd-66-4, TT 66-60574

Unclassified report

Includes translations for Jan-Apr 65.

Descriptors: (*Pesticides, Abstracts), (*Diseases, Microorganisms), (*Agriculture, Pesticides), (*Soil mechanics, Abstracts), Fungicides, Herbicides, Insecticides, Fertilizers, Hallucinogens, Aerosols, Ecology, Micrometeorology, Toxicity, Vaccines, Viruses, Immunity, Disease vectors

The report is a survey by a team of analysts covering the following areas: Chemical factors: Pesticides; Herbicides; Fertilizers; Psychotomimetics; Other chemicals. Biological factors: Pathogens. Environmental factors: Aerosols; Ecology; Micrometerology; Soil Science. This combined report, the first of a series of monthly surveys, includes items selected for catch-up purposes, as well as current materials. The proportion of current material will tend to increase in future reports.

**AD-628 848 Fld. 6/6, 2/1, 8/13, 6/13, +**
**CFSTI Prices: HC $3.00 MF $0.75**
*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*
**CBE FACTORS: MONTHLY SURVEY NO. 2.**
ATD work assignment no. 50.
1966, 58p. Rept. no. ATD-66-13, TT 66-60646

Unclassified report

Series of monthly surveys covering the following areas: I. Chemical Factors. II. Biological Factors. III. Environmental Factors. See also AD-628 294.

Descriptors: (*Agriculture, Pesticides), (*Pesticides, Abstracts), (*Soil mechanics, Abstracts), Diseases, Microorganisms, Fertilizers, Aerosols, Epidemiology, Toxicology, Viruses, Disease vectors, Meteorological parameters, Wind, Boundary layer, Atmospheric motion, Atmospheric precipitation, Herbicides, USSR

The monthly survey is based on Communist World open sources. It is the second in a series of monthly surveys covering the following areas: I. Chemical factors (pesticides, herbicides, fertilizers, psychotomimetics, other chemicals); II. Biological factors (pathogens); III. Environmental factors (aerosols, ecology, micrometeorology, soil science). Available translations of additional sources pertinent to the three subject areas are listed. There is no bibliography. (Author)

**AD-628 106 See Fld. 6/3**

**AD-628 553 See Fld. 6/13**

## 6/8. FOOD

**AD-628 377 Fld. 6/8**
**CFSTI Prices: HC $4.00 MF $1.00**
*PILLSBURY MILLS INC MINNEAPOLIS MINN*

**ALL PURPOSE MATRICES FOR COMPRESSED FOOD BARS.**
Final technical rept., 29 Aug 62-8 Nov 64,
by Jack R. Durst. Jan 66; 149p. Contract DA-19-129-AMC-2103, Proj. DA-7X84-06-031, FD 66-1 ,FD 37

Unclassified report

Descriptors: (*Food, Binders), (*Binders, Food), (*Dehydrated foods, Binders), Storage, Physical properties, Adhesion, Preparation, Tests, Packaging, Taste, Odors, Military rations

Edible binders were developed which impart favorable physical properties including cohesiveness to compressed dry foods representing a broad range of chemical compositions. Further experimental effort yielded binders for compressed foods which can also be rehydrated to yield a familiar meal item, such as casseroles, creamed soups, puddings, thin soups and beverages. These binders do not significantly alter the storage stability of the basic food components. (Author)

**AD-628 419 Fld. 6/8, 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**STRUCTURAL-MECHANICAL PROPERTIES OF STARCH PASTES,**
by E. I. Kovalevskaya, and O. D. Kurilenko. 4 Feb 66, 4p. Rept. no. I-9054-B
TT 66-60603

Unclassified report

Strukturno-Mekhanicheskie Svoistva Krakhmalnykh Kleisterov, trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Pishchevaya Tekhnologiya (USSR) n1 p40-3 1964.

Descriptors: (*Starches, Gelatins), (*Gelatins, Mechanical properties), Colloids, Deformation, Elasticity, Viscosity, Temperature

The relationship between deformation and shift-stress in starch paste is studied. It is shown that the limit of elasticity depends on concentration of starch in a paste, on thermal processing and mechanical dispersion. (Author)

**AD-628 421 Fld. 6/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**THE EFFECT OF WETTING CORN GRAIN ON TS PHYSICO-MECHANICAL PROPERTIES,**
by I. K. Chaika. 4 Feb 66, 5p. Rept. no. i-9054-D
TT 66-60605

Unclassified report

Vliianiya Uvlazheniya Zerna Kukuruzy na ego Fiziko-Mekhanicheskie Svoistva, trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Pishchevaya Tekhnologiya (USSR) n1 p79-81 1964.

Descriptors: (*Corn, Mechanical properties), Moisture, Adsorption (Physical), Temperature, Hardness, Time, Shear stresses, Loading (Mechanics), Data, USSR

Values of disintergrating force are given for various types and hybrids of corn, and also the work required to disintegrate 1 kg of grain depending on the degree of wetting, setting time, and water emperature.

**AD-628 422 Fld. 6/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**CONCERNING CREAM-FORMING CAPACITY OF BUTTER,**
by V. M. Vergelesov, and B. A. Nikolaev. 4 Feb 66, 9p. Rept. no. I-9054-E
TT 66-60606

Unclassified report

O Kremoobrazuyushchei Sposobnosti Slivochnogo Masla, trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Pishchevaya Tekhnologiya (USSR) n1 p87-94 1964.

Descriptors: (*Milk fat, Processing), Production, Scientific research, USSR

Causes are explained for insufficient cream-forming capacity of butter made in cylindrical butter churns of the existing mass-production line. Basic requirements are formulated for butter to satisfy its cream-forming capacity. (Author)

**AD-628 429 Fld. 6/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**A CONFERENCE ON SUBLIMATION DRYING OF FOOD PRODUCTS,**
by V. D. Surkov, and E. J. Kaukhcheshvili. 4 Feb 66, 3p. Rept. no. I-9054-G
TT 66-60608

Unclassified report

Konferentsiya po Sublimatsionnoi Sushke Pishchevykh Produktov, trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Pishchevaya Tekhnologiya (USSR) n1 p174 1964.

Descriptors: (*Food, Freeze drying), (*Freeze drying, Food), (*Symposia, Food), USSR

**AD-628 430 Fld. 6/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**CONCERNING SOME FEATURES OF WETTING AND DEHYDRATION OF GRAIN,**
by G. A. Egorov. 4 Feb 66, 7p. Rept. no. I-9054-A,
TT 66-60609

Unclassified report

O Nekotorykh Osobennostyakh Uvlazhneniya i Obezvozhivaniya Zerna, trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Pischchevaya Tekhnologiya (USSR) n1 p13-9 1964.

Descriptors: (*Cereals, Water), (*Absorption (Physical), Cereals), (*Dehydration, Cereals), Corn, Reaction kinetics, Food, Scientific research, USSR

It has been established that the sharp difference in structure of capsules and endosperms substantially effects not only absorption or extraction of moisture, but also physico-chemical processes which alter the density and structure of grain. This process is the deterioration of the endospherm and a method of observing this phenomena is propounded. It is shown that the intensity of physicochemical processes in grain is determined by the intensity of internal moisture transmission. The nature of absorption and extraction of moisture by grain lots is established and explained; deepening of evaporation zones during dehydration of grain is demonstrated. (Author)

## 6/10. INDUSTRIAL (OCCUPATIONAL) MEDICINE

**AD-628 175 Fld. 6/10**
*AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO*
**ON NOISE AND VIBRATION EXPOSURE CRITERIA,**
by Henning E. von Gierke. 21 Apr 65, 17p. Rept. no. AMRL-TR-65-84,
Proj. AF-7231, Task 723101,

Unclassified report

*Availability: Published in Archives of Environmental Health v11 p327-39 Sep 1965. Copies to DDC users only.*

Descriptors: (*Noise, Tolerances (Physiology)), (*Vibration, Tolerances (Physiology)), Sonic boom, Performance (Human), Industrial medicine, Standards, Supersonic planes, Stress (Physiology)

## 6/11. LIFE SUPPORT

**AD-628 566 Fld. 6/11**
*AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO*
**LOW AMBIENT PRESSURE ENVIRONMENTS AND TOXICITY. A NEW APPROACH TO SPACE CABIN TOXICOLOGY,**
by Anthony A. Thomas. 28 May 65, 11p. Rept. no. AMRL-TR-65-93,
Proj. AF-6302, Task 630201,

Unclassified report

*Availability: Published in Archives of Environmental Health v11 p316-22 Sep 1965. Copies to DDC users only.*

Descriptors: (*Closed ecological systems, Toxicity), (*Spacecraft cabins, Life support), Low-pressure research, Oxygen, Ozone, Nitrogen compounds, Tetroxides, Carbon tetrachloride

A unique inhalation exposure facility was built to study the effects of low atmospheric pressure and oxygen-rich atmospheres on the characteristics of truly uninterrupted, long-term, continuous exposure to toxic chemicals. The first experiments include exposure of a large number of mice, rats, dogs, and monkeys to graded doses of ozone, nitrogen tetroxide, and carbon tetrachloride in a 100% oxygen atmosphere at 5 psi pressure for 2 weeks duration. Further, a 90-day exposure to 5 psi 100% oxygen of a similar animal complement is also reported. Biochemical and enzymatic changes related to toxic exposure are discussed together with the future experiments planned for this facility. (Author)

## 6/12. MEDICAL AND HOSPITAL EQUIPMENT AND SUPPLIES

**AD-628 047 Fld. 6/12, 6/5**
**CFSTI Prices: HC $3.00 MF $0.75**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**THE MECHANICAL TANTALUM SUTURE IN GASTRIC RESECTIONS,**
by Yu. Ya. Gritsman. 5 Nov 65, 80p. Rept. no. FTD-TT-65-971,
TT 66-60507

Unclassified report

Unedited rough draft trans. of mono. Tantalovyi Mekhanicheskii Shov pri Rezektsiyakh Zheludka, M Moscow, 1961 80.

Descriptors: (*Surgical supplies, Tantalum), (*Gastrointestinal system, Surgery), Blood vessels, Surgical techniques, USSR, Muscles, Excision

Contents: Devices used for gastric resection (Apparatus for suturing gastric stumps, Device for suturing blood vessels in deep cavities, Apparatus for lateral gastrointestinal anastomoses, Apparatus for application of seromuscular sutures, Apparatus for suturing the entire pulmonary radix (UKL); Techniques for gastric resection by the Billroth II method using suturing devices.

## 6/13. MICROBIOLOGY

**AD-628 125 Fld. 6/13, 6/5**

*NAVAL MEDICAL FIELD RESEARCH LAB CAMP LEJEUNE N C*

**MAST CELL DISRUPTION AND OTHER CHANGES IN THE PERICORNEAL TISSUE MORPHOLOGY AFTER INTRAPERITONEAL INJECTIONS OF A POTENT HISTAMINE LIBERATOR (COMPOUNDS 48/80).**

Interim rept.,
by John W. Garden. Feb 66, 14p. Rept. no. Vol. 16/No. 3,
NAVMED MR005.12-7020.1.11

Unclassified report

*Availability: Published in Investigative Opthalmology, v4 n5 p835-43 Oct 1965. Copies to DDC users only.*

Descriptors: (*Cornea, Histology), (*Histamine, Cornea), Cells (Biology), Leukocytes, Healing, Morphology (Biology)

Fluorometric assay for corneal histamine after intravenous injection of compound 48-80 revealed a significant elevation over the level in saline controls. Following intraperitoneal injection of the histamine liberator, compound 48/80, degranulation and disruption of the perilimbal mast cells were noted in whole mount preparations. This was accompanied by accumulation of leukocytes and subsequently round cells in azure eosinate - stained sections of the perilimbal capillary are and morphologic changes in the fibroblasts and endothelial cells. The cellular reaction subsided by 24 hours after the initial injection, although mast cell-regeneration continued for at least 14 days. The significance of these findings with regard to the inflammatory reaction and to previous studies using isolated mast cell constituents is discussed. (Author)

**AD-628 126 Fld. 6/13, 6/5**

*NAVAL MEDICAL RESEARCH UNIT NO 4 GREAT LAKES ILL*

**THAYER-MARTIN SELECTIVE MEDIUM FOR THE CULTIVATION OF NEISSERIA MENINGITIDIS FROM THE NASOPHARYNX,**

by J. D. Thayer, P. F. Frank, and J. E. Martin.
Jun 65, 8p.
NAVMED MR005.09-1300.1

Unclassified report

*Availability: Published in American Journal of Public Health, v55 n6 p923-7 Jun 1965. Copies to DDC users only.*

Descriptors: (*Neisseria meningitidis, Culture media), (*Culture media, Neisseria meningitidis), Neisseriaceae, Diseases, Throat, Disease vectors, Selection

A medium is reported which enables Neisseria meningitidis to be cultivated while selectively inhibiting most of the normal flora of the nasopharynx. The use of this medium increased the detection of meningococcal carriers by 50%. This medium could be useful, particularly in surveillance programs. (Author)

**AD-628 153 Fld. 6/13, 6/3**

*TEXAS UNIV GALVESTON DEPT OF MICROBIOLOGY*

**SUSCEPTIBILITY OF PEROMYSCUS CALIFORNICUS CALIFORNICUS TO INFECTION WITH LEISHMANIA DONOVANI,**

by Ardzroony Packchanian, and Loretta Kelly.
15 Aug 65, 9p. Contract NSF-G-14253,

Unclassified report

*Availability: Published in Texas Reports on Biology and Medicine, v23 n4 p767-75 1965. Copies to DDC users only.*

Descriptors: (*Mice, Laboratory animals), (*Leishmania, Infections), Sensitivity, Parasites, Pathology, Spleen

Laboratory-reared Peromyscus californicus californicus (American deer mouse), inoculated with the Khartoum strain of Leishmania donovani, was found susceptible to this parasite. The animals sacrificed at various intervals of the infection showed characteristic lesions of visceral leishmaniasis. The most conspicuous finding in the autopsies was the enlargement of the spleen. Smears from the spleen, liver, kidney, and in one experiment from the bone marrow were found positive for macrophages parasitized with Leishman-Donovan bodies (L. D. bodies). Examinations of sections from the spleen, liver, kidney, and in one experiment from the lung and striated muscle revealed widespread granulomatous lesions containing macrophages, the cytoplasm of which was densely parasitized with L. D. bodies. Numerous giant cells which were heavily parasitized with L. D. bodies were also found in most of the sections. The intensity of parasitism and the degree of involvement of the different tissues varied in each mouse. Heart blood and portions of the heart, liver, kidney, and spleen inoculated into the water of condensation of blood agar slants (NNP-2 medium) yielded positive cultures of leptomonad forms of L. donovani which were readily subcultured in vitro. (Author)

**AD-628 325 Fld. 6/13, 6/3, 6/1**
**CFSTI Prices: HC $1.60 MF $0.50**

*BRUSSELS UNIV (BELGIUM) LABORATOIRE DE GENETIQUE*

**GENETIC REPLICATION AND MACROMOLECULAR SYNTHESIS IN TEMPERATE BACTERIOPHAGES.**

Final rept.,
by Rene Thomas. Feb 66, 11p. Contract AF-EOAR-20-65, Proj. AF-9777, Task 977701, AFOSR 66-0178

Unclassified report

Descriptors: (*Bacteriophages, Genetics), (*Genetics, Bacteriophages), (*Chromosomes, Bacteriophages), (*Ribosomes, Bacteriophages), Immunology, Polymers, Biosynthesis, Life cycle, Mutation, Escherichia coli, Proteins, Belgium

The direct effect of the immunity repressor on genetic replication was confirmed. As for the control of genetic expression, immunity acts directly on an early unit of expression which most probably includes gene N: the later functions are controlled indirectly. They are normally switched on by the first wave of expression, which itself is controlled by immunity. A difference was found in the protein complement of the 30S ribosomes, associated with an amber-suppressor mutation. The ribosomes thus seem to play an active role in the specificity of translation. (Author)

**AD-628 391 Fld. 6/13, 6/1**

*MEDICAL RESEARCH COUNCIL OXFORD (ENGLAND) CELL METABOLISM RESEARCH UNIT*

**MICROBIAL GROWTH ON C-1 COMPONENTS. SYNTHESIS OF CELL CONSTITUENTS BY METHANEAND METHANOL-GROWN PSEUDOMONAS METHANICA,**

by Patricia A. Johnson, and J. R. Quayle. 4 Nov 64, 11p. Contract AF-EOAR-62-45, AFOSR 65-2973

Unclassified report

Supported in part by Public Health Service.

*Availability: Published in Biochem. J. (Gt. Brit.) v95 p859-67 1965. Copies to DDC users only.*

Descriptors: (*Pseudomonas, Culture media), (*Culture media, Pseudomonas), (*Methane, Metabolism), (*Methanols, Metabolism), Microorganisms, Growth, Cells (Biology), Biosynthesis, Tracer studies, Carbonates, Chromatographic analysis, Autoradiography, Organic phosphorus compounds, Great Britain

A study was made of the incorporation of carbon from methane-C14, methanol-C14 and bicarbonate -C14 by cultures of Pseudomonas methanica growing on methane, and methanol-C14 by cultures of the same organism growing on methanol. Over 90% of the radioactivity fixed from labelled methane or methanol at the earliest times of sampling appeared in phosphorylated compounds. Glucose phosphate and fructose phosphate together constituted the largest part of the radioactive phosphates (70-90%). The first stable products of bicarbonate -C14 fixation were malate and aspartate. The percentage of the total radioactivity fixed that was contained in each of the radioactive compounds was plotted against time. The slopes of the curves obtained show that hexose phosphates are primary stable products of labelled methane and methanol incorporation and that aspartate and malate are primary stable products of bicarbonate-C14 incorporation. No carboxydismutase activity was found in cell-free extracts of the organism. This fact, together with the other findings, shows that an autotrophic metabolism involving the ribulose diphosphate cycle of carbon dioxide fixation cannot be operating. (Author)

**AD-628 492 Fld. 6/13**
**CFSTI Prices: HC $1.10 MF $0.50**

*ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C*

**ANTIGENIC STRUCTURE OF THE VACCINE STRAIN OF BAC, ANTHRACIS,**

by E. N. Levina, and L. N. Kats. Dec 65, 10p.
Rept. no. FSTC-381-T65-691,
Proj. G7-1050,
TT 66-60620

Unclassified report

Trans. of Zhurnal Mikrobiologii, Epdiemiologii i Immunobiologii (USSR) v41 n10 p85-9 Oct 1964.

Descriptors: (*Bacillus anthracis, Antigens + antibodies), Vaccines, Cytology, Cytochemistry, Morphology (Biology), Fluorescent antibody techniques, Pepsins, Trypsin, Muramidase, Proteins, Polysaccharides, USSR

Antigens of the vaccine strain of Bac. anthracis are localized in the cell capsule and membrane. Three antigen complexes, each with a definite localization in the cell and with different properties, may be distinguished in the composition of these structures. The surface antigens of the capsule, whose location could be determined in the cell by means of capsul-luminescence serum, are sensitive to the action of pepsin and partly also of trypsin and appear to be peptides. The capsule antigens proper are located in the base layer of the capsule and detected by means of both capsule and membrane sera; they contain substances of a protein-polysaccharide nature, sensitive to trypsin, chemotrypsin, hyaluronidase, and lysozyme. The antigens of the cell membrane, detected by means of membrane-luminescence sera, contain substances of both protein and polysaccharide nature, sensitive to the action of lysozyme and trypsin. (Author)

**AD-628 553 Fld. 6/13, 6/15, 6/6, 15/2**
**CFSTI Prices: HC $4.60 MF $0.50**

*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*

**CBE FACTORS: ANNOTATED BIBLIOGRAPHY.**

Rept. no. 3 on ATD work assignment no. 50,
by Daniel M. Pyle. 30 Dec 65, 47p. Rept. no. ATD-65-117,
TT 66-60630

Unclassified report

Based on open-source literature pub. 1 Jan 63 -31 Dec 64. Rept. on Surveys of Soviet Scientific and Technical Literature. See also AD-618 467.

Descriptors: (*Biological warfare agents, Bibliographies), (*Chemical warfare agents, Bibliographies), (*Aerosols, Bibliographies), Ecology, Pesticides, Abstracts, Agriculture,

Insect control, Immunity, Nervous system, USSR, Bacterial aerosols, Microorganisms

Of 193 entries 12 are devoted to aerosols, 133 to biological pathogens, 3 to ecology, 42 to chemical substances, and 3 to agricultural chemicals. Subject matter covered includes: subcutaneous and aerosol immunization, aerosol particles, dust dispersion, pesticide cylinder propellent, bacterial aerosol dynamics, botulism pathogen, pasteurellosis, mass rosol immunization, chemical vaccine against zoonoses, Q-fever, Brucella classification, botulin detection, resistance to antibiotics, tick-borne encephalitis, tetracycline effect on immunity, zoogeography, histobiochemical investigation of thiol protein groups, noradrenalin effect on higher nervous activity, cardiopathogenic diet component effect on nervous system, chemical excitants of pain, serotonin effect on mitotic activity, anticonvulsive drugs, psychotropic drugs, phosphoorganic insecticides. (Author)

**AD-628 666 Fld. 6/13, 6/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY BIOLOGICAL LABS FREDERICK MD*
**IMMUNOFLUORESCENCE, AN ANNOTATED BIBLIOGRAPHY. III. STUDIES OF FUNGI, METAZOA, PROTOZOA, AND RICKETTSIAE,**
by Warren R. Sanborn. Dec 65, 49p. Rept. no. Miscellaneous Pub-3,

Unclassified report

Descriptors: (*Immunology, Fluorescent antibody techniques), (*Fluorescent antibody techniques, Bibliographies), Fungi, Protozoa, Rickettsia, Antigens + antibodies, Histological techniques,, Diagnosis, Biological stains, Indexes, Subject indexing

The volume is one of a series of six annotated bibliographies on various aspects of immunofluorescence and its use. Citations cover the period 1905 through 1962. Volume III contains 117 annotated literature citations, arranged according to major subject areas, and a complete author index. (Author)

**AD-628 689 Fld. 6/13**
*WASHINGTON UNIV SEATTLE SCHOOL OF MEDICINE*
**THE FINE STRUCTURE OF TWO UNUSUAL STALKED BACTERIA,**
by Jack L. Pate, and Erling J. Ordal. 6 Apr 65, 19p. Contract Nonr-477 (43),

Unclassified report

*Availability: Published in Journal of Cell Biology, v27 n1 p133-50 1965. Copies to DDC users only.*

Descriptors: (*Cell structure, Bacteria), (*Bacteria, Cell structure), Membranes (Biology), Cytoplasm, Electron microscopy, Morphology (Biology), Life cycle, Biological stains

Two strains of bacteria that produce slender appendages (pseudostalks) from their lateral surfaces were studied using the electron microscope. The pseudostalks were shown to be extensions of the cytoplasm and peripheral membranes of the cell proper. Both strains of bacteria produce holdfasts at the poles of the cells by the means of which attachment can take place. The pseudostalks are not involved in the attachment of cells. No specialized intracytoplasmic structures are present at the point of juncture of pseudostalk and cell. A discussion of the possible functions of the pseudostalks, based on the electron microscope findings, is presented. (Author)

**AD-628 294 See Fld. 6/6**

**AD-628 384 See Fld. 6/5**

**AD-628 619 See Fld. 6/5**

**AD-628 741 See Fld. 6/16**

**AD-628 821 See Fld. 6/1**

**AD-628 848 See Fld. 6/6**

## 6/14. PERSONNEL SELECTION AND MAINTENANCE (MEDICAL)

**AD-628 713 Fld. 6/14, 6/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*NATIONAL JEWISH HOSPITAL DENVER COLO*
**LACTIC ACID PHYSICAL FITNESS AND HIGH ALTITUDE.**
Progress rept.,
by Cutting B. Favour. Feb 66, 39p. Contract DA-49-193-MD-2446,

Unclassified report

Descriptors: (*Physical fitness, High altitude), (*Lactic acid, Physical fitness), Acclimatization, Exercise, Relaxation (Physiology), Blood chemistry, Hyperventilation, Oxygen consumption, Hematology, Electrolytes (Physiology), Adaptation (Physiology), Tolerances (Physiology), Hypoxia, Performance (Human)

Healthy young men acclimatized to 5,300 feet and in a sedentary state were assembled in the spring of 1963, 1964 and 1965 for a two-variable four-part study of the effect of physical fitness on acute exposure to one week's residence at 14,150 feet. In part one, the subjects underwent a battery of tests of ambient altitude. In part two, immediately thereafter, these tests were repeated at 14,150 feet. The subjects then returned to ambient altitude where they spent 4-5 weeks in a physical conditioning program. In part three, the test battery was repeated at the end of the fitness program and in part four, another week of tests at 14,150 feet was completed. These studies indicate that a month of physical training significantly lowers both the resting and exercise arterial blood lactic acid level using a bicycle ergometer work load at 600 Kg m/min. Exposure to altitude raised resting and exercise HLA levels in the sedentary state but did not alter the lowered values of the fit state. Fitness also prevented at altitude the hyperventilation and increased oxygen consumption seen in the second 5 minutes of the 10 minute work period in the sedentary state. A number of hematological, blood gas and electrolyte responses to exercise and to altitude were not altered by becoming fit. Subjects in the fit state were less symptomatic and more effective in technical duties at altitude than when in a sedentary state. (Author)

## 6/15. PHARMACOLOGY

**AD-628 587 Fld. 6/15**
*COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS*
**IN VIVO EFFECT OF NALIDIXIC ACID (NEGGRAM) ON THE DNA OF HUMAN DIPLOID CELLS IN TISSUE CULTURE,**
by Herbert S. Rosenkranz, and Caryl Lambek. 21 Jul 65, 4p. Contract Nonr-266 (89) Proj. NR-103-574,

Unclassified report

*Availability: Published in Proceedings of the Society for Experimental Biology and Medicine, v120 p549-52 1965. Copies to DDC users only.*

Descriptors: (*Antibiotics, Desoxyribonucleic acids), (*Desoxyribonucleic acids, Molecular structure), Tissue culture cells, In vivo analysis, Urinary system, Infections

DNA isolated from human ammion cells after exposure to nalidixic acid (NegGram) for 48 hours was structurally modified. The altered DNA possessed properties resembling those of nucleic acids isolated from cells treated with alkylating agents. (Author)

**AD-628 593 Fld. 6/15**
**CFSTI Prices: HC $4.60 MF $0.50**
*HINE LABS INC SAN FRANCISCO CALIF*
**RESEARCH ON THERAPY OF PULMONARY EDEMA ASSOCIATED WITH OXIDIZERS.**
Final rept. 15 May 64-30 Jun 65,
by Charles H. Hine, Richard D. Cavalli, and Robert R. Wright. Nov 65, 49p. Contract AF 33 (615)-1781, Proj. AF-6302, Task 630202, AMRL TR-65-178

Unclassified report

Descriptors: (*Edema, Chemotherapeutic agents), (*Lungs, Edema), (*Oxidizers, Toxicity), Dioxides, Nitrogen compounds, Oxygen, Therapy

An evaluation was made of candidate therapeutic agents for the treatment of acute pulmonary edema resulting from nitrogen dioxide exposure. Treatments consisting of hyperbaric air and oxygen; tracheal toilet; ethyl, isopropyl, and octyl alcohol vapors; hydralazine; bethanechol; physostigmine; and isoproterenol aerosols produced no change in the mortality, survival time, or lung/body weight ratios of rats suffering from N02induced acute pulmonary edema. Rutin in large doses caused a decrease in mortality and an increase in survival time of exposed rats. Intravenous infusion of isoproterenol caused a decrease in mortality in rabbits exposed to N02. The effectiveness of hyperbaric oxygen, hydrocortisone, rutin and bethanechol against moderate exposure to N02 was determined by solvent uptake measurements with rats. Oxygen administered 4 hours after exposure increased solvent uptake. There were no significant effects due to the other compounds. (Author)

**AD-628 294 See Fld. 6/6**

**AD-628 368 See Fld. 6/16**

**AD-628 384 See Fld. 6/5**

**AD-628 553 See Fld. 6/13**

**AD-628 741 See Fld. 6/16**

**AD-628 848 See Fld. 6/6**

## 6/16. PHYSIOLOGY

**AD-628 081 Fld. 6/16**
**CFSTI Prices: HC $3.00 MF $0.50**
*PARMA UNIV (ITALY) INST OF HUMAN PHYSIOLOGY*
**PHYSIOLOGY OF CENTRAL VISUAL PATHWAYS.**
Final rept. 1 Jan-31 Dec 65,
by A. Arduini. 20 Jan 66, 55p. Rept. no. IHP-65-2,
Contract AF-EOAR-8-65, Proj. AF-9777, Task 977701,
AFOSR 66-0176

Unclassified report

Descriptors: (*Vision, Nervous system), Physiology, Brain, Stimulation, Illumination, Intensity, Nerve cells, Nerve fibers, Electrophysiology, Cats, Italy

The transfer functions of Lateral Geniculate Nucleus and of Visual Cortex I have been determined under conditions of steady state flickering illumination at fixed intensity. The results are compared with those of steady non-flickering stimulation. Microelectrode recordings under conditions of steady illumination with non-flickering light of different intensities have been made from individual fibers in the geniculo-cortical and in the corticothalamic tracts. An analysis of mean discharge frequency and of interspike interval distribution has been performed. (Author)

**AD-628 115 Fld. 6/16, 6/1**
**CFSTI Prices: HC $5.60 MF $0.50**
*KAROLINSKA INSTITUTET STOCKHOLM (SWEDEN) DEPT OF PHYSIOLOGY*
**DISTRIBUTION AND FUNCTION OF ADRENERGIC NERVES IN THE RABBIT FALLOPIAN TUBE,**
by Jan Brundin. 1965, 58p. Contract AF-EOAR-52-65,
AFOSR 65-2510

Unclassified report

Published in Acta Physiologica Scandinavica, v66 suppl. 259.

Descriptors: (*Nerves, Reproductive system), (*Reproductive system, Autonomic nervous system), (*Autonomic nervous system, Reproductive system), (*Adrenal medulla hormones, Reproductive system), Epinephrine, Levarterenol, Distribution, Rabbits, Sweden

Contents: Distribution of noradrenaline and adrenaline and of adrenergic nerve terminals in the fallopian tube of the rabbit; Functional studies on the adrenergic innervation of the circular muscles of the rabbit oviduct.

**AD-628 211 Fld. 6/16**
**CFSTI Prices: HC $1.60 MF $0.50**
*NAVAL AEROSPACE MEDICAL INST PENSACOLA FLA*
**ARCHITECTURE OF THE OTOLITH END ORGAN: WITH SOME FUNCTIONAL CONSIDERATIONS,**
by Makoto Igarashi. 8 Dec 65, 17p.
Rept. no. 127,
NAVMED MR005.13-6001-127-1

Unclassified report

Descriptors: (*Vestibular apparatus, Histological techniques), (*Histological techniques, Vestibular apparatus), Ear, End organs, Semicircular canals, Morphology (Biology), Microscopy, Bone, Monkeys

The otolithic membrane is extremely fragile and is easily destroyed by post-mortem changes, tonic change, strong chemicals, et cetera. The routine technique of temporal bone preparation usually includes the use of a strong fixative and decalcifier; therefore, the structural preservation of this structure in histological slides is uncertain. An attempt was made to preserve the otolithic architecture as naturally as possible. In studying squirrel monkey temporal bones the results obtained with three different decalcifiers are compared. The best architectural preservation of the otolithic end organ was obtained after 10% formalin fixation, dehydration, celloidin embedding, and 10% EDTA decalcification. The morphological features of this end organ are discussed from the functional viewpoint. It is confirmed that, except for the otoconia, basically both otolith and semicircular canal end organs have almost similar components. (Author)

**AD-628 246 Fld. 6/16**
**CFSTI Prices: HC $1.60 MF $0.50**
*LYON UNIV (FRANCE) DEPT OF EXPERIMENTAL MEDICINE*
**NEUROPHYSIOLOGICAL MECHANISMS OF THE STATES OF SLEEP.**
Final rept. Jul 64-Sep 65,
by M. Jouvet. 15 Oct 65, 13p. Contract AF-EOAR-64-66, Proj. AF-9777, Task 977701,
AFOSR 65-2655

Unclassified report

Descriptors: (*Sleep, Physiology), Neurology, Amines, France, Electrophysiology, Pharmacology, Electroencephalography

The main findings are: (1) Neuroanatomical evidence that two different systems are responsible for tonic and phasic phenomena during paradoxical sleep (P.S.). (2) Neuropharmacological evidence that these two systems depend upon different mechanisms related with monoamines.

**AD-628 266 Fld. 6/16**
*STANFORD UNIV CALIF DEPT OF PHYSIOLOGY*
**PRESYNAPTIC EFFECTS OF POTASSIUM ION ON THE MAMMALIAN NEUROMUSCULAR JUNCTION,**
by Rodney L. Parsons, William W. Hoffmannand, and George A. Geigen. 1965, 4p. Contract
Nonr-225 (46) ,PHS-HE-03693

Unclassified report

Prepared in cooperation with Veterans Administration Hospital, Palo Alto, Calif., Dept. of Neurology.

*Availability: Published in Nature v208 n5010 p590-1 6 Nov 1965. Copies to DDC users only.*

Descriptors: (*Neuromuscular transmission, Potassium), (*Electrolytes (Physiology), Neuromuscular transmission), (*Potassium, Neuromuscular transmission), Nerve cells, Stimulation, Ions, Nerve impulses

Work was carried out in order to determine whether the action of potassium on neuromuscular transmission could be accounted for by an increase in the probability of stimulus-evoked transmitter release. The results indicate that the potassium has at least two direct effects on neuromuscular transmission. It increases the probability of release of transmitter by a nerve impulse and it also raises the number of quanta of transmitter in the readily releasable store.

**AD-628 298 Fld. 6/16**
**CFSTI Prices: HC $1.60 MF $0.50**
*HOPITAL HENRI ROUSSELLE PARIS (FRANCE) LABORATOIRE DE NEUROPHYSIOLOGIE*
**VISCERAL AFFERENT ACTIVITY EFFECTS ON BRAIN STEM RETICULAR FORMATION.**
Final technical rept., 1 Jul 64-30 Jun 65,
by P. C. Dell. 1 Jul 65, 16p. Contract AF-EOAR-51-64, Proj. AF-9777, Task 977701,
AFOSR 66-0810

Unclassified report

Descriptors: (*Sleep, Nervous system), (*Nervous system, Stimulation), Nerve cells, Blood vessels, France, Electrophysiology, Brain

There appears to be regional differences in the reticular core in the sense of a ventro-dorsal and caudo -rostral organization. These results are discussed in relation with histological data obtained by degeneration experiments and physiological results of intra-reticular stimulation or recordings with macro- and micro-electrodes. Special emphasis is put on the fact that the organization disclosed by these stimulation experiments shows good agreement with the distinction of reticular regions mainly occupied by long-exoned neurons (responsible therefore for short-lasting activations) and the ones mainly occupied by multi-synaptic short -axoned circuits whose role in the long-lasting delayed activation is stressed. (Author)

**AD-628 309 Fld. 6/16**
**CFSTI Prices: HC $31.90 MF $1.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**CONFERENCE OF THE I. P. PAVLOV ALL-UNION PHYSIOLOGICAL SOCIETY (NO.10), EREVAN, 1964. VOLUME I: ABSTRACTS OF SYMPOSIA PAPERS.**
30 Sep 65, 323p. Rept. no. FTD-TT-65-46, TT 66-60583

Unclassified report

Unedited rough draft trans. of Svezd Vsesoyuznogo Fiziologicheskogo Obshchestva (no. 10) Erevan, 1964. Referaty Dokladov na Simpoziumakh v1, 1964 180p.

Descriptors: (*Physiology, Symposia), Mathematical models, Neuromuscular transmission, Electroencephalography, Central nervous system, Autonomic nervous system, Conditioned reflex, Electrophysiology, Parasympathomimetic agents, Adaptation (Physiology), Acclimatization, Nerve cells, Biophysics, Muscles, Metabolism, Kidneys, Excretion, Brain, Appetite, Thirst, Blood circulation, Reproduction (Physiology), Blood coagulation, Pancreas, Pathology, Abstracts

Contents: Physiology of the nerve cell and synaptic transmission; Mathematical analysis of experimental and clinical electroencephalograph data Biophysiological bases of bioelectric activity; Functional structural bases of conditioned and unconditioned reflexes; Possible mathematical and simulation approaches for studying the functional mechanisms of physiological systems; Modeling of nervous activity; Physiology of the autonomic nervous system; Pharmacology of cholinergic drugs; Problems of neural tropics; Physiology of muscle contraction; Intracellular metabolism control; Physiology of the kidneys and of water salt metabolism; Problems relating to physiology of internal analyzers; Humoral link of interoceptive reactions; Physiology of hunger and thirst; Clinical physiology; Central controls of blood circulation; Physiology of blood coagulation; Physiology and pathology of the pancreatic gland; Physiological adaptation to heat, cold, high altitudes and desert conditions; Neurohumoral control of the reproductive function.

**AD-628 333 Fld. 6/16, 20/6**
**CFSTI Prices: HC $2.60 MF $0.50**
*MICHIGAN UNIV ANN ARBOR COLL OF ENGINEERING*
**TRANSMISSION OF THE HUMAN EYE.**
Final rept., 15 Mar 62-14 Aug 65,
by E. A. Boettner, and J. R. Wolter. Jan 66, 28p.
Rept. no. 05096-1-F,
Contract AF 33 (657)-8880, Proj. AF-6301,
Task AF-630103,

Unclassified report

Descriptors: (*Optics, Physiology), (*Light transmission, Eye), (*Eye, Light transmission), Measurement, Light, Scattering, Ophthalmology, Pathology, Radiation effects

The total transmittance of light through the whole human eye has been measured at 466, 566, 666, and 800 millimicrons. The forward scattering of light in passing through the eye was also measured. The results obtained on four of five specimens shortly after enucleation showed that the average maximum transmittance was 81.6% at 666 millimicrons. The forward scattered light outside of 1 degree was 35% = 5% for the five specimens at 566 and 666 millimicrons. (Author)

**AD-628 340 Fld. 6/16**
*CLEVITE CORP BEDFORD OHIO PIEZOELECTRIC DIV*
**CAROTID SINUS AND AORTIC REFLEXES IN THE REGULATION OF CIRCULATION DURING SLEEP,**
by Maurizio Guazzi, and Alberto Zanchetti. 1 Dec 64, 3p. Contract AF-EOAR-41-64,
AFOSR 65-2524

Unclassified report

Prepared in cooperation with Impressa di Ellettrofisiologia del Consiglio Nazionale delle Richere, Siena, Italy.

*Availability: Published in Science, v148 n3668 p397-9 Apr 16 1965. Copies to DDC users only.*

Descriptors: (*Sleep, Blood pressure), (*Blood pressure, Sleep), Blood circulation, Cardiovascular system, Aorta, Reflexes, Electroencephalography, Cats, Italy

In the cat with intact sino-aortic reflexes, episodes of deep sleep are accompanied by marked falls in

both systolic and diastolic blood pressure. The falls are much larger after bilateral sino-aortic deafferentation: to such low pressures during deep sleep that episodes of transient cerebral ischemia (electroencephalographic flattening and seizures) sometimes occur. (Author)

**AD-628 352 Fld. 6/16**
*PISA UNIV (ITALY) ISTITUTO DI FISIOLOGIA*
**RETINAL GANGLION CELL ACTIVITY IN CATS DURING DARK ADAPTATION,**
by G. W. Hughes, and L. Maffei. 1965, 5p. Contract AF-EOAR-9-63, Proj. AF-9777, Task 977701,
AFOSR 65-2963

Unclassified report

*Availability: Published in Nature, v205 n4971 p601-2 6 Feb 1965. Copies to DDC users only.*

Descriptors: (*Vision, Adaptation (Physiology)), Retina, Ganglia, Thresholds (Physiology), Nervous system, Electrophysiology, Cats, Nerve cells, Nerve impulses, Italy

The time-course of threshold changes tested by means of short pulses of light and the time-course of the spontaneous firing rate of the same ganglion cell are completely different. From this observation it is concluded that: (1) any process of dark adaptation, either limited to the receptors or involving the neural elements of the retina, does not influence the ganglion cell dark discharge, at least after the transient period; (2) the dark discharge is likely to represent the spontaneous activity of deafferented retinal neurones; and (3) since there is good evidence that the visual threshold during the process of dark adaptation is determined neurally rather than at the receptor level, it is likely that the dark deafferentation occurs between the bipolar and the ganglion cell. (Author)

**AD-628 354 Fld. 6/16**
*PISA UNIV (ITALY) ISTITUTO DI FISIOLOGIA*
**ON THE ORIGIN OF THE DARK DISCHARGE OF RETINAL GANGLION CELLS,**
by G. W. Hughes, and L. Maffei. 1965, 18p. Contract AF-EOAR-9-63, Proj. AF-9777, Task 977701,
AFOSR 65-2962

Unclassified report

*Availability: Published in Arch. ital. Biol. v103 p45-59 1965. Copies to DDC users only.*

Descriptors: (*Vision, Adaptation (Physiology)), (*Retina, Nerve impulses), Nerve cells, Electrophysiology, Ganglia, Light, Stimulation, Cats, Italy

In petrigeminal or decerebrate cats microelectrode spike recording from the retina was performed. The pulses were counted in one second every two seconds after having exposed the eye from 2 to 5 minutes to a very strong light (4000 Lux). The firing rate of the ganglion cells became stationary in two to three minutes after the light cutoff, while the threshold went on decreasing for a long time (up to 1 hour). The shapes of the transients of the ganglion cell firing rate as a function of time for 'on' and 'off' cells are presented. Because no relationship was observed during dark adaptation between the threshold changes and the ganglion cell firing rate, the conclusion was drawn that the dark discharge is not due to the activity of the receptors, but may rather be regarded as the expression of the autochthonous activity of the deafferented neural part of the retina. Other considerations lead to the hypothesis that the bipolar cells do not contribute to the activity of the ganglion cells in darkness. (Author)

**AD-628 358 Fld. 6/16, 6/1**
*MAUDSLEY HOSPITAL LONDON (ENGLAND)*
**CONTINUOUS RECORDING OF CHANCES IN MEMBRANE POTENTIAL IN MAMMALIAN CEREBRAL TISSUES IN VITRO; RECOVERY AFTER DEPOLARIZATION BY ADDED SUBSTANCES,**
by I. M. Gibson, and H. McIlwain. 29 Apr 64, 25p. Contract AF-EOAR-1-63,
AFOSR 65-2839

Unclassified report

Prepared in cooperation with London Univ. (England), Dept. of Biochemistry.

*Availability: Published in J. Physiol. v176 p261-83 1965 (Great Britain). Copies to DDC users only.*

Descriptors: (*Cerebral cortex, Electrophysiology), Tissues (Biology), Mammals, In vitro analysis, Guinea pigs, Electrolytes (Physiology), Potassium compounds, Sodium compounds, Chlorides, Glutamic acid, Calcium, Semipermeability, Cell structure, Membranes (Biology), Tissue fluids, Great Britain

Apparatus is described for maintaining slices of mammalian cerebral cortex under good metabolic conditions while continuous recordings were made of membrane potential, with micropipette electrodes. The average stable resting potential observed was 59 plus or minus 10 mV (s.d.). Potentials recorded in media 2.6 mM in calcium were more stable than those in media containing 0.75 mM calcium. Measured amounts of KCl in about 1 microliter of fluid were applied to the tissue surface. They diminished the resting potential, which subsequently recovered. The course of this change was compared with changes in potassium concentration near the cell calculated to result by diffusion. Addition to the tissue surface of sodium glutamate in small volumes of fluid also resulted in depolarization of cell elements, followed by recovery; a similar comparison was made of glutamate concentration and potential change. The sodium, potassium and chloride of the tissues were determined before and after incubation; in some cases incubation media contained inulin and this also was determined. (Author)

**AD-628 360 Fld. 6/16, 6/18**
**CFSTI Prices: HC $2.60 MF $0.50**
*NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF*
**SUPPRESSION OF DNA SYNTHESIS IN WEANLING RAT KIDNEYS BY SHORT-TERM FASTING,**
by Theodore L. Phillips, and Louis W. Wachtel. 14 Dec 65, 23p. Rept. no. usnrdl-TR-956, NAVMED MR005.08-5201-1

Unclassified report

Descriptors: (*Desoxyribonucleic acids, Synthesis), (*Starvation, Desoxyribonucleic acids), (*Whole body irradiation, Kidneys), Tritiated compounds, Thymedines, Labeled substances, Autoradiography, Diet, Mitosis, Excision, Rats

The effect of restricted food intake on DNA synthesis in the kidney has been measured in weanling rats by means of injections of tritiated thymidine followed by an assessment of the number of labeled nuclei in autoradiographs. A marked decrease in renal thymidine uptake occurs after 16 hours of food deprivation. Even when refeeding was initiated after 20 hours food deprivation, DNA synthesis remained depressed for some 24 hours. Furthermore, the mitotic stimulus produced by unilateral nephrectomy was not strong enough to overcome the effects of starvation. The results suggest that in the weanling rat the kidney DNA synthetic system is particularly sensitive to caloric intake, and that this fact must be taken into account in evaluating the effects of whole body X-irradiation on the kidney. (Author)

**AD-628 368 Fld. 6/16, 6/15**
*CENTRE D'ETUDES DE PHYSIOLOGIE NERVEUSE ETD'ELECTROPHYSIOLOGIE PARIS (FRANCE)*
**RESPONSES OF MONKEY THALAMUS TO SOMATIC STIMULI UNDER CHLORALOSE ANAESTHESIA,**
by Denise Albe-Fessard, and David Bowsher. 17 Nov 64, 16p. Contract AF-EOAR-13-63, AFOSR 65-2830

Unclassified report

*Availability: Published in Electroencephalography and Clinical Neurophysiology, v19 p1-15 1965. Copies to DDC users only.*

Descriptors: (*Thalamus, Stimulation), (*Electrophysiology, Thalamus), Chloralose, Anesthesia, Response, Electroencephalography, Monkeys, France

The localisation and characteristics of responses to somatic stimuli have been investigated by means of anatomo-electrophysiological methods in the thalamus and adjacent structures of Macaca cynomolgus under chloralose anaesthesia. Somatotopic responses were found in the nucleus ventralis posterior, exactly like those seen under barbiturates or in the waking animal by other workers. Short latency convergent responses, from all limbs, were evoked in the nucleus suprageniculatus. Long latency convergent responses were observed in nuclei geniculatus medialis (pars magnocellularis), parafascicularis, commissuri posterioris, in the ventral parts of nucleus lateralis posterior, in parts of ventralis lateralis, and occasionally in nuclei reticularis thalami, centralis lateralis and the lateralmost part of nucleus dorsalis medialis. Preferential responses, in the sense of (a) greater amplitude of response to stimulation of one limb, or (b) absence of representation of one or two limbs were seen in the centrum medianum and in the ventral part of n. ventralis lateralis, overlying VPL. In general, long latency convergent and preferential responses could only be evoked by brusque (not necessarily noxious) natural stimuli, and never by phasic hair movement or light touch, of the sorts that were found to evoke somatotopic responses in VP. The natural type of stimulus giving rise to responses in VL has not been determined. (Author)

**AD-628 372 Fld. 6/16**
*FREIE UNIVERSITAET BERLIN (WEST GERMANY) PHYSIOLOGISCHES INSTITUT*
**UBER DAS UNTERSCHIEDLICHE VERHALTEN DER DIURESE BEI INTRAPORTALEN UND INTRACAVALEN INFUSIONEN VON WASSER UND 0,9O/O NACLLOSUNG AN DER WACHEN RATTE (THE DIFFERENT DIURETIC EFFECTS OF WATER AND ISOTONIC SALINE INFUSION INTO THE PORTAL VEIN AND VENA CAVA OF THE UNANESTHETIZED RAT),**
by F. J. von Haberich, O. Aziz, and P. E. Nowacki. 1964, 2p. Contract AF-EOAR-63-65, Proj. AF-9777, Task 977701,
AFOSR 65-2964

Unclassified report

Text in German.

*Availability: Published in Pflugers Archiv fur die gesamte Physiologie, v279 1964. Copies to DDC users only.*

Descriptors: (*Urine, Secretion), (*Osmosis, Stimulation), Cannulation, Veins, Parenteral infusions, Water, Sodium compounds, Chlorides, Liver, Statistical analysis, Rats, West Germany

Fine cannulae were implanted in the portal vein and inferior vena cava of female rats so that normal blood flow was not disrupted during the month-long experimental period. Solutions at physiological temperature were infused at a constant rate (3ml/hr). Diuresis was measured by catheterization. When distilled water was infused for a short time (20 min equal to 1 ml), only the portal

route resulted in an increased diuresis (up to 180%). Water infusion for an hour by the two different routes was distinguished by the latency period prior to the onset of diuresis and by the maximum diuretic values. The differences were statistically significant (p less than o.01 or p less than 0.06). An one-hour infusion of 0.9% NaCl (3ml/hr) by the portal route led to no rise in diuresis, while the caval infusion produced a distinct increase. These findings show that an osmotic stimulus in the region of the portal vein or liver triggers a response that leads to an increase in diuresis. (Author)

**AD-628 378 Fld. 6/16**
*PISA UNIV (ITALY) ISTITUTO DI FISIOLOGIA*
**INTRACELLULAR RECORDING FROM NEURONES OF THE RETICULAR FORMATION,**
by F. Magni, and W. D. Willis. 1965, 12p. Contract AF-EOAR-62-9, Proj. AF-9777, Task 977701,
AFOSR 65-2948

Unclassified report

*Availability: Published in Studies in Physiology, p206-14 1965. Copies to DDC users only.*

Descriptors: (*Nerve cells, Brain), Nerve fibers, Nerve impulses, Stimulation, Nerves, Electrophysiology, Italy

**AD-628 379 Fld. 6/16**
*PISA UNIV (ITALY) ISTITUTO DI FISIOLOGIA*
**OCULAR PHENOMENA DURING SYNCHRONIZED AND DESYNCHRONIZED SLEEP (LES PHENOMENES OCULAIRES AU COURS DU SOMMEIL SYNCHRONISE ET DESYNCHRONISE),**
by G. Berlucchi, and P. Strata. 1963, 26p. Contract AF 61 (514)-1125,AF-EOAR-62-9 Proj. AF-9777, Task 977701,
AFOSR 65-2947

Unclassified report

Centre National de la Recherche Scientifique. Colloques Internationaux, Lyon (France) 9-11 Sep 63, n127, p285-307.

*Availability: Published in Aspects Anatomo-Functionnels de la Physiologie du Summeil, Paris, 1965 p285-307. Copies to DDC users only.*

Descriptors: (*Sleep, Physiology), (*Eye, Motion), Adaptation (Physiology), Vision, Italy

A review is given of the ocular manifestations of sleep under the subtopics pupils, visual accommodation, eye movements, and eyelids.

**AD-628 389 Fld. 6/16**
*EDINBURGH UNIV (SCOTLAND)*
**A RELATIONSHIP BETWEEN ADRENALINE AND THE MODE OF ACTION OF OXYTOCIN AND OESTROGEN ON VASCULAR SMOOTH MUSCLE,**
by A. L. Haigh, Sybil Lloyd, and Mary Pickford. 30 Oct 64, 7p. Contract AF-EOAR-62-79,
AFOSR 65-2949

Unclassified report

*Availability: Published in J. Physiol., v178 p563-76 1965. Copies to DDC users only.*

Descriptors: (*Epinephrine, Muscles), (*Pituitary hormones, Muscles), (*Estrogens, Muscles), Veins, Blood circulation, Stimulation, Pharmacology, Great Britain

**AD-628 403 Fld. 6/16, 5/10**
*CALIFORNIA UNIV LOS ANGELES BRAIN RESEARCH INST*
**ELECTROPHYSIOLOGICAL PATTERNS AND CEREBRAL IMPEDANCE CHARACTERISTICS IN ORIENTING AND DISCRIMINATIVE BEHAVIOR,**
by W. R. Adey. 1965, 16p. Contract AF-AFOSR-246-63 ,PHS-NB-01883
AFOSR 65-2838

Unclassified report

*Availability: Published in Excerpta Medica International Congress, Series 87 p324-39 Sep 1965. Copies to DDC users only.*

Descriptors: (*Brain, Electrophysiology), (*Electrophysiology, Behavior), Electroencephalography, Nerve cells, Nerve impulses, Nervous system, Learning, Conditioned reflex, Thalamus, Vision, Electrical impedance, Lysergic acids, Cats, Humans

Processing and storage of information in cerebral tissue has been studied with major emphasis on transactional mechanisms, relating a specified sensory stimulus to subsequent patterns of firing of single neurons, sampled from much larger and far from homogeneous populations, or to evoked potentials recorded grossly in a substantial domain of cerebral tissue. Such techniques thus usually attempt to relate a transient stimulus, and the brief ensuing evoked response, to the current status of the individual neuron, or of the neuronal system of which it is a part, as these patterns of activity may reflect adaptive responses modified by previous experience. It is an inherent difficulty in such an approach that electrophysiological responses of this type may occupy only a small proportion of the available signal space in neuronal systems characterized by continuous and apparently random activity, and having much redundancy. Nor would it appear likely that such techniques would necessarily reveal the nature of long term changes in physicochemical structure underlying the permanent storage of information in cerebral tissue. For these reasons, evidence was sought of patterns in the on-going EEG activity accompanying the performance of learned tasks not involving rhythmic environmental stimuli. (Author)

**AD-628 433 Fld. 6/16, 6/1**
*BUENOS AIRES UNIV (ARGENTINA) INSTITUTO DE ANATOMIA GENERAL Y EMBRIOLOGIA*
**5 - HYDROXYTRYPTOPHAN - DECARBOXYLASE ACTIVITY IN NORMAL AND DENERVATED PINEAL GLAND OF RATS,**
by Amanda Pellegrino de Iraldi, and Georgina Rodriguez de Lores Arnaiz. 18 Apr 64, 6p. Contract AF-AFOSR-314-63,
AFOSR 65-2835

Unclassified report

*Availability: Published in Life Sciences, v3 p589-93 1964. Copies to DDC users only.*

Descriptors: (*Enzymes, Endocrine glands), (*Endocrine glands, Enzymes), Ganglia, Rats, Argentina

The 5-hydroxytryptophan decarboxylase was determined in normal and denervated pineal glands. In the experimental glands the determination was made at 2.5, 5, 10, 12 and 30 days after bilateral gangliectomy of the superior sympathetic ganglia. The results show an increase in enzyme activity in the denervated gland which may be as large as 150 per cent after 2.5 days and persists until 30 days. The tentative hypothesis is postulated that the pineal nerves contain an inhibitory substance of the enzyme which disappears after denervation. (Author)

**AD-628 435 Fld. 6/16, 6/1**
*BUENOS AIRES UNIV (ARGENTINA) INSTITUTO DE ANATOMIA GENERAL Y EMBRIOLOGIA*
**ULTRASTRUCTURE AND PHARMACOLOGICAL STUDIES OF NERVE ENDINGS IN THE PINEAL ORGAN,**
by A. Pellegrino de Iraldi, L. M. Zieher, and E. de Robertis. 1965, 34p. Contract AF-AFOSR-314-63,
AFOSR 65-2836

Unclassified report

*Availability: Published in Progress in Brain Research v10 p389-422 1965. Copies to DDC users only.*

Descriptors: (*Endocrine glands, Nerves), (*Nerve fibers, Endocrine glands), Amines, Rats, Argentina, Brain, Pharmacology, Microstructure

The work was initiated to investigate the origin of the nerve fibres innervating the pineal gland and particularly the nature of the granular vesicles present in these nerve endings. For this purpose two principal approaches were used: Some rats were submitted to the bilateral extirpation of the superior cervical ganglia, and others were submitted to the action of drugs that may alter the metabolism of catechol and indolamines. In both cases the glands were fixed and studied under the electron microscope, and the changes occurring in the nerve fibres and endings were specially recorded. Preliminary determinations of 5-HT content were also carried out in normal and denervated glands and in some of the rats treated with some of the agents that may change in this indolamine. (Author)

**AD-628 462 Fld. 6/16, 6/5**
*TORONTO UNIV (ONTARIO) DEPT OF MEDICAL BIOPHYSICS*
**HOST-CELL INTERACTIONS IN MICE BEARING ISOLOGOUS HEMOPOIETIC GRAFTS (LA GREFFE DES CELLULES HEMATOPOIETIQUES ALLOGENIQUES),**
by E. A. McCulloch, J. E. Till, and L. Siminovitch. 1965, 15p. Contract DRB-9350-14 ,MA-1420

Unclassified report

Text in English; Attached Summary in French.

*Availability: Published in Centre National de la Recherche Scientifique. Colloques Internationaux n147 p61-71 Paris (France) 1965. Copies to DDC users only.*

Descriptors: (*Hemopoietic system, Transplantation), (*Transplantation, Immunology), Genetics, Mutations, Antigen-antibody reactions, Mice, Canada, Cells (Biology)

Results are reported of studies of three genetically determined anemias in mice using the spleen-colony method. The three loci are the W locus, the Sl locus and F locus. Mice of genotypes WW (v) and SlSl (d) have similar phenotypes. Animals of each genotype have white fur, black eyes, a severe macrocytic anemia, and an unusually high sensitivity to the lethal effects of ionizing radiation. each has a different defect which affects colony-formation. Cells from marrow and spleen of mice of genotype WW (v) fail to form colonies normally in irradiated recipients, although hemopoietic cells from normal mice form colonies in the spleens of unirradiated mice of genotype WW (v). In contrast, cells from mice of genotype SlSl (d) form colonies in irradiated recipients, but the growth of normal cells is greatly inhibited when these are transplanted into irradiated mice of genotype SlSl (d). It is suggested that both the W locus and the Sl locus control functions essential for successful colony-formation, and that the site of action of the W locus is intrinsic to colony-forming cells, while the site of action of the Sl locus is a host factor extrinsic to colony-forming cells. Mice homozygous for the mutant gene f are anemic in utero, but normal hemoglobin values are established by the end of the second week of life. (Author)

**AD-628 740 Fld. 6/16**
*LUND UNIV (SWEDEN)*
**DISTRIBUTION OF ADRENERGIC NERVES TO ORBITAL STRUCTURES,**
by Berndt Ehinger. 1964, 4p. Contract AF-EOAR-5-64 ,NIH-NB-02854
AFOSR 65-2511

Unclassified report

*Availability: Published in Acta Physiol. Scand., v62 p291-2 1964. Copies to DDC users only.*

Descriptors: (*Eye, Autonomic nervous system), Nerves, Nerve fibers, Fluorescence, Histology, Sweden

**AD-628 741 Fld. 6/16, 6/13, 6/1, 6/15**
*GOTEBORG UNIV (SWEDEN) DEPT OF PHARMACOLOGY*
**HISTOCHEMICAL AND BIOCHEMICAL DETECTION OF MONOAMINE RELEASE FROM BRAIN NEURONS,**
by Arvid Carlsson, Annica Dahlstrom, KjellFuxe, and Margit Lindqvist. 8 Feb 65, 10p. Contract AF-EOAR-30-64 ,N1H-NB-04359-02 AFOSR 65-2854

Unclassified report

*Availability: Published in Life Sciences, v4 n7 p809-16 1965. Copies to DDC users only.*

Descriptors: (*Brain, Amines), (*Nerve cells, Amines), (*Amines, Nerve cells), (*Neuromuscular transmission, Amines), Histological techniques, Biochemistry, Enzyme inhibitors, Levarterenol, Reserpine, Psychotropic agents, Amino acids

Treatment of rats kept at 29C ambient temperature with pargyline resulted in histochemically detectable release of monoamines from the synaptic terminals of the monoamine neurons in the brain, with biochemically detectable lowering of noradrenaline levels and accumulation of 3-O-methylated metabolites. The accumulation of noradrenaline in nerve terminals in the brain following L-dopa administration to rats pretreated with reserpine and nialamide could be largely prevented by agents blocking the amine transport through the nerve cell membrane (desmethylimipramine or protiptyline), as demonstrated both histochemically and biochemically. (Author)

**AD-628 804 Fld. 6/16, 6/5**
**CFSTI Prices: HC $2.60 MF $0.50**
*NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF*
**CELL PROLIFERATION AND DNA SYNTHESIS AFTER UNILATERAL NEPHRECTOMY AS RELATED TO AGE,**
by Theodore L. Phillips, and George F. Leong. 21 Dec 65, 27p. Rept. no. USNRDL-TR-955, NAVMED MR005.08-5201-1

Unclassified report

Descriptors: (*Desoxyribonucleic acids, Synthesis), (*Kidneys, Excision), (*Cytology, Kidneys), (*Cells (Biology), Mitosis), Tritiated compounds, Thymidines, Autoradiography, Labeled substances, Regeneration, Aging (Physiology), Rats

The effect of unilateral nephrectomy on DNA synthesis, as measured by tritiated thymidine autoradiography, and on mitotic index in both weanling and adult rat was measured. In the weanling rat group, the control animals showed a base line thymidine index (number of labeled cells per 50 oil immersion fields) of 74, and the adult animals an index of 9.6. In response to unilateral nephrectomy a peak value of 447 was obtained in the weanling animals and 98 in the adult animals, both peaks occurring at 36 hours. Mitotic counts were 7 in the weanling control animals and 0.5 in the adults, with a peak at 36 hours of 37 and 7, respectively. Separate counts of tubule and stromal cells in the cortex revealed that the increase in labeling occurred later in the stromal cells than in the tubule cells, the stromal cells not reaching a maximum until 57 hours after nephrectomy. The results indicate that although the relative rate is much lower in adult animals, a similar response, qualitatively, is obtained in both groups following unilateral nephrectomy. The findings also indicate that the stromal cells respond in a different fashion to the stimulus of unilateral nephrectomy and appear to lag behind the response of the tubule cells. (Author)

**AD-628 167** **See Fld. 6/1**

**AD-628 674** **See Fld. 6/19**

**AD-628 727** **See Fld. 6/3**

## 6/17. PROTECTIVE EQUIPMENT

**AD-628 367 Fld. 6/17**
**CFSTI Prices: HC $1.60 MF $0.50**
*AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO*
**EFFECTS OF VARIOUS GASES ON HANDGEAR INSULATION.**
Final rept. Sep 64-Mar 65,
by John F. Hall,Jr., Willi J. Buehring, and Wolfgang W. Strobl. Dec 65, 18p. Rept. no. amrl-TR-65-4,
Proj. AF-7164, Task 716409,

Unclassified report

Descriptors: (*Protective clothing, Gloves), (*Gloves, Thermal insulation), Gases, Carbon dioxide, Freons, Helium, Effectiveness, Thermal conductivity, Tests, Test methods

The effect of gases having different thermal conductivities on the thermal insulation of handgear was investigated. Experimental mittens with special plastic spacer interliners of various thicknesses were sealed between gas impermeable outer and inner shells and filled first with room air (as control), then various experimental gases, and thermal insulation measured on a copper hand. Experimental gases included carbon dioxide, Freon-12, and helium. Comparative results are presented in terms of percentage insulation change; clo per inch; conductivity (K) values; and the measured thermal insulation (clo) values. Before all tests each mitten was evacuated (13 cm Hg) to remove all entrapped air, then filled without contamination with the control, or experimental gas. Gas within the handgear was maintained at a constant positive pressure (7.6 mm water) throughout each experiment. Mean measurements showed significant increases (13-32%) of thermal insulation for Freon-12 and carbon dioxide, with decreased insulation observed with helium. Significance and some practical application of these results for protective clothing design are shown.

**AD-628 678 Fld. 6/17, 1/2**
**CFSTI Prices: HC $4.00 MF $1.00**
*AVIATION SAFETY ENGINEERING AND RESEARCH PHOENIX ARIZ*
**HELMET DESIGN CRITERIA FOR IMPROVED CRASH SURVIVAL.**
Final technical rept.,
by J. L. Haley,Jr., J. W. Turnbow, S. Macri, and G. J. Walhout. Jan 66, 135p. Contract DA-44-177-AMC-254 (T) Task DA-1P125901A14230, USAAVLABS TR-65-44

Unclassified report

Descriptors: (*Helmets, Design), (*Aviation safety, Helmets), Aviation accidents, Crash injuries, Survival, Aviation personnel, Army personnel, Acceleration tolerance, Head, Deceleration, Impact shock, Impact tests, Safety harness, Ventilation, Cockpits, Drop testing, Materials

The major crash survival variables affecting the design and testing of U. S. Army aircrewmen helmets are presented and discussed in this report. Such factors as head acceleration limits, impact velocity, impact surfaces, impact sites, suspension and retention harnesses, helmet ventilation, impact test methods and structural concepts are considered. An examination of all available data on the tolerance of the human head to deceleration was conducted. Consideration was given to an analysis of acceptable design limits. A parallel study of head injuries occurring in aircraft accidents was conducted to determine the significant injury areas of the head and correlate this to protection area and techniques. A cockpit survey was conducted to develop criteria for testing the helmet and liner materials. Consideration was given during the program to a preliminary investigation of helmet retention systems and head cooling techniques. A series of instrumented drop tests was conducted to investigate various helmet design concepts and materials. Double-shell and single-shell helmets of nearly equal weight were analyzed. The advantages and disadvantages of three different methods of helmet impact testing are discussed. (Author)

**AD-628 679 Fld. 6/17, 1/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*AVIATION SAFETY ENGINEERING AND RESEARCH PHOENIX ARIZ*
**IMPACT TEST METHODS FOR HELMETS. SUPPLEMENT I TO HELMET DESIGN CRITERIA FOR IMPROVED CRASH SURVIVAL,**
by J. W. Turnbow. Jan 66, 24p. Contract DA-44-177-AMC-254 (T) Task OA-1P125901A14230, USAAVLABS TR-65-44A-Suppl-1

Unclassified report

Descriptors: (*Aviation safety, Helmets), (*Helmets, Design), (*Impact tests, Helmets), Head, Simulation, Test methods, Equations

**AD-628 680 Fld. 6/17, 1/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*AVIATION SAFETY ENGINEERING AND RESEARCH PHOENIX ARIZ*
**TEST RESULTS - HEMISPHERICAL SPECIMENS, SUPPLEMENT II TO HELMET DESIGN CRITERIA FOR IMPROVED CRASH SURVIVAL,**
by J. L. Haley Jr., and J. W. Turnbow. Jan 66, 21p. Contract DA-44-177-AMC-254 (T) Task DA-1P125901A14230, USAAVLABS TR-65-44B-Suppl-2

Unclassified report

Descriptors: (*Aviation safety, Helmets), (*Helmets, Design), Annealing, Magnesium, Aluminum, Nylon, Glass textiles, Hemispherical shells, Accleration

## 6/18. RADIOBIOLOGY

**AD-628 121 Fld. 6/18**
*DEFENCE CHEMICAL BIOLOGICAL AND RADIATION LABS OTTAWA (ONTARIO)*
**THE EFFECT OF X-RADIATION ON THE CELL SIZE DISTRIBUTION OF THYMUS LYMPHOCYTES,**
by P. V. Vittorio, S. Blehm, and D. Linkletter. 19 Mar 65, 12p. Rept. no. DCBRL-475,

Unclassified report

*Availability: Published in Canadian Journal of Physiology and Pharmacology v44 p77-87 1966. Copies to DDC users only.*

Descriptors: (*Lymphocytes, Radiation effects), (*Thymus, Lymphocytes), Cells (Biology), Distribution, X rays, Spleen, Canada

The effect of X-irradiation on the cell size distribution of thymus lymphocytes was studied with the aid of an electronic Coulter cell counter. In the thymus the small lymphocytes were the most radioresistant and the large lymphocytes were repopulated before the medium -sized lymphocytes. As the radiation dose was increased from 50 to 400 r, there was a decrease in the large to small thymocyte ratio, and a longer time period was required for a return to the normal ratio. Single and repeated doses of X-irradiation produced much the same type of effect on the large to small ratio of both thymus and spleen lymphocytes, and it was concluded that the effects of X-irradiation on the cell size distribution of lymphocytes in the thymus and spleen were similar. (Author)

**AD-628 443 Fld. 6/18**
**CFSTI Prices: HC $2.60 MF $0.50**
*NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF*
**THE EFFECTS OF VARIOUS GASES WITHIN THE NASAL CAVITIES OF RATS ON THE RESPONSE OF OLFACTORY BULB NEURONS TO X IRRADIATION,**
by G. P. Cooper, D. J. Kimeldorf, and G. C. McCorley. 22 Dec 65, 21p. Rept. no. USNRDL-TR-958,
Unclassified report

Descriptors: (*Paranasal sinuses, Gases), (*Radiation effects, Paranasal sinuses), (*Nose, Radiation effects), Nerve cells, Sense organs, X rays, Air, Oxygen, Argon, Nitrogen, Rats

Extracellular microelectrode recordings were made from single neurons of the olfactory bulb in anesthetized tracheotomized rats. Air, oxygen, argon, and nitrogen were perfused through the nasal cavities in order to determine whether the response of olfactory bulb neurons to x-rays was dependent on the particular gas present within the nasal cavities. Head-only x-irradiation (250 KVP, 100 R/minute) produced responses in many neurons during the perfusion of all four gases used. Such responses were ordinarily depressed, however, during argon or nitrogen perfusion as compared with the responses obtained during air or oxygen perfusion. In some cases, argon and nitrogen abolished the response to radiation within 5 minutes. It was concluded that the response of olfactory bulb neurons to x-rays was not dependent on the presence within the nasal cavities of any of the gases used. It was also concluded that the response of olfactory bulb neurons to x-irradiation depends upon an effect on olfactory receptors, since the response could be modified in most cases by the perfusion of argon and nitrogen. (Author)

**AD-628 791 Fld. 6/18**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF*
**RECOVERY FROM RADIATION INJURY IN DOGS AS EVALUATED BY THE SPLIT-DOSE TECHNIQUE,**
by E. John Ainsworth, and George F. Leong. 30 Dec 65, 28p. Rept. no. USNRDL-TR-964, NAVMED MR005.08-5201-1
Unclassified report

Descriptors: (*Radiation injuries, Recovery), Dogs, Radiation tolerance, Radiological dosage, Metabolism, Hematology, Leukocytes, Statistical analysis, Tables, Split-dose technique

The split-dose technique was used to evaluate recovery from radiation injury in dogs given an initial conditioning exposure to 217 R, which is approximately 2/3 of the LD50. Based on LD50's determined at 1, 3, 7, 14, and 20 days after the conditioning exposure, recovery is rapid with 50% recovery occurring by about 3 days. Because of relatively large 95% confidence intervals, the recovery rate per se is difficult to establish. An exponential curve with a recovery half-time of 3.1 days may be an acceptable fit to the data. However, between 3 and 20 days the animals' radiosensitivity appeared to change linearily at a rate of approximately 8.5 R/day. At 20 days approximately 40 R of radioresistance was detected, but this was not statistically significant. The numbers of circulating leucocytes were followed for several months after exposure to 150 R or 217 R. The leucocyte counts return to only 70-80% of the pre-irradiation values by approximately 4 months. The data are discussed in terms of the proposed correlation between recovery from radiation injury and basal metabolic rate or changes in the number of circulating leukocytes. (Author)

**AD-628 360** **See Fld. 6/16**

**AD-628 601** **See Fld. 14/5**

## 6/19. STRESS PHYSIOLOGY

**AD-628 291 Fld. 6/19**
**CFSTI Prices: HC $1.60 MF $0.50**
*NAVAL AEROSPACE MEDICAL INST PENSACOLA FLA*
**MODIFICATION OF VESTIBULAR SENSITIVITY IN THE RAT,**
by David C. Riccio, Makoto Igarashi, and Arnold Eskin. 17 Nov 65, 18p. Rept. no. NAMI-950, Contract NASA Order-R-93, NAVMED MR005.13-6001.1-125
Unclassified report

Descriptors: (*Streptomycins, Toxicity), (*Vestibular apparatus, Sensitivity), (*Rotation, Vestibular apparatus), Rats, Stress (Physiology), Thresholds (Physiology), Stimulation

A study was made to determine the effects of vestibular damage or previous vestibular stimulation on the spontaneous activity of the rat during rotation. Unilateral destruction of the labyrinth through intratympanic injections of streptomycin sulfate decreased the sensitivity of unrestrained rats to rotation, as measured by the maintenance of high levels of spontaneous locomotor activity during rotation. Repeated exposure to rotation produced a similar threshold shift in undamaged rats. Normal control animals showed a marked decrement in activity while rotated. Rats were extremely resistant to streptomycin sulfate injected systemically; neither morphological damage to hair cells nor changes in the response to vestibular stimulation was found following a total dosage of 10,000 mg of the drug. The findings demonstrated that the spontaneous activity levels provide a sensitive behavioral measure of the effects of vestibular stimulation on the rat. (Author)

**AD-628 314 Fld. 6/19**
*SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX*
**HYPOKINESIA SECONDARY TO CHAIR REST FROM 4 TO 10 DAYS,**
by Lawrence E. Lamb, Paul M. Stevens, and Robert L. Johnson. Aug 65, 13p. Rept. no. SAM-TR-65-236,
Proj. AF-7755,
Unclassified report

*Availability: Published in Aerospace Medicine v36 n8 p755-63 Aug 1965. Copies to DDC users only.*

Descriptors: (*Relaxation (Physiology), Tolerances (Physiology)), (*Space medicine, Confined environments), (*Confined environments, Tolerance (Physiology)), Body weight, Blood volume, Erythrocytes, Exercise, Muscles, Extremities, Degradation, Physical fitness, Weightlessness, Space flight, Manned, Motion

The effects of inactivity during chair rest for periods of four days, six days, eight days, and ten days were studied. Despite the presence of body weight and the dependent position of the lower extremities deconditioning occurred. The average decrease in total blood volume after ten days was slightly greater than the average noted after 11 days of bed rest. The average plasma volume loss and the average decrease in red cell mass was similar to that observed after 11 days of bed rest. Orthostatic tolerance and exercise tolerance were progressively diminished with longer periods of chair rest. This study demonstrates that confinement resulting in muscular inactivity causes deconditioning even when normal gravitational factors cause body weight and increased hydrostatic pressure below the diaphragm. For this reason deconditioning during manned space flight may be markedly influenced by confinement with restricted body movement, independent of what influence weightlessness may have on its development. (Author)

**AD-628 552 Fld. 6/19**
**CFSTI Prices: HC $1.60 MF $0.50**
*SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX*
**F-101/F-106 FLIGHT SIMULATOR FLASHBLINDNESS EXPERIMENT.**
Rept. for Mar-Jun 65,
by James E. Hamilton. Dec 65, 17p. Rept. no. SAM-TR-65-82,
Proj. AF-6301, Task 630103,
Unclassified report

Descriptors: (*Flashblindness, Pilots), (*Performance (Human), Stress (Physiology)), Flight simulators, Cockpits, Illumination, Fighters, Adaptation (Physiology), Vision, Control, Afterimages

An investigation was made to determine the effect of flashblindness on aircraft control in the F-106A and the F-101B flight simulators. In addition, a study was made to determine how much cockpit illumination is required to reduce flashblindness to minimum recovery time. It was found that approximately 42% of the flashblinded pilots tested did not accomplish a programed escape maneuver. Instrument panel floodlighting immediately after the flash significantly reduced recovery time. Floodlighting the panel with 300 ft.-c. illumination did not significantly reduce recovery time more than illumination with 100 ft.-c. (Author)

**AD-628 567 Fld. 6/19**
*AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO*
**BEHAVIOR OF SERUM LACTIC DEHYDROGENASE IN MEN EXPOSED TO BRIEF, INTENSE THERMAL IMPULSES,**
by Duncan E. McVean, and Leandro Rendon. Dec 65, 6p. Rept. no. AMRL-TR-65-105,
Proj. AF-6302, Task 630202,
Unclassified report

*Availability: Published in Aerospace Medicine v36 n12 p1192-3 Dec 1965. Copies to DDC users only.*

Descriptors: (*Thermal stresses, Humans), Oxidoreductases, Performance (Human), Stress (Physiology), Blood serum, Aviation medicine

Lactic dehydrogenase isozyme patterns in serum obtained from human subjects exposed to brief, intense thermal impulses were determined by electrophoresis on acrylamide gel. Total lactic dehydrogenase activity of the serum was also determined using a standard clinical method. No change was observed in either the serum lactic dehydrogenase isozyme pattern or in the total lactic dehydrogenase activity. (Author)

**AD-628 674 Fld. 6/19, 6/16**
*AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO*
**FREE FATTY ACID RESPONSES TO TILTING AFTER WATER IMMERSION,**
by Jack K. Goldman. 10 Jul 64, 8p. Rept. no. AMRL-TR-65-77,
Proj. AF-7222,
Unclassified report

*Availability: Published in Journal of Applied Physiology, v20 n3 p395-7 1965. Copies to DDC users only.*

Descriptors: (*Stress (Physiology), Fatty acids), (*Levarterenol, Metabolism), Urine, Excretion, Amines, Underwater, Tolerances (Physiology), Medical examination, Autonomic nervous system, Blood pressure, Pulse rate, Glucose, Blood chemistry, Posture

Water immersion is accompanied by decreased urinary excretion of noradrenaline and is followed by orthostatic intolerance. The latter has been postulated to result from impaired noradrenaline metabolism. Such an impairment would produce, in addition, a diminished rise in plasma free fatty acids in response to tilting. This response was measured in normals after office control, water immersion and exposure to a thermal environment identical to that found in the immersion facility. The plasma free fatty acid response to a tilt is impaired after water immersion as would be expected if sympathetic nervous system dysfunction is involved in postimmersion orthostatic intolerance. Author)

**AD-628 823 Fld. 6/19**
**CFSTI Prices: HC $4.60 MF $0.50**
*NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C*
**MINIMAL-RECOMPRESSION, OXYGEN-BREATHING APPROACH TO TREATMENT OF DECOMPRESSION SICKNESS IN DIVERS AND AVIATORS.**
Research rept.,
by Maxwell W. Goodman, and Robert D. Workman. 15 Nov 65, 49p. Rept. no. RR-5-65, Proj. BuShips-SF-001-06-05, Task 11513-2,
Unclassified report

Descriptors: (*Decompression sickness, Therapy), Oxygen, Pressure breathing, Diving, Medical examination, Tolerances (Physiology), Stress (Physiology), Statistical analysis

With growing awareness of the incremental frequency with which difficulties are encountered in recompression treatment of severely injured patients, and the grossly inadequate decompressions now characterizing the civilian diver casualty population applying to USN recompression facilities, evaluation and clinical trials of therapeutic procedures, alternative to USN treatment tables, were undertaken. These techniques are particularly suitable for recompression management of aviators' dysbarism when descent to sea level has not provided complete palliation. The proportion of good results obtained with initial recompression trials with these procedures has significantly exceeded that obtained in recent years, with the Diving Manual tables, although the current series of 79 cases surpassed comparable casualty groups in average case severity. Hypothetical and practical aspects of the treatment concept and technique are presented, and contraindications noted. There were no adverse responses to the 2.8 atmospheres absolute PO2, and nine normal volunteer subjects showed no impairment of timed vital capacity following test exposures. (Author)

**AD-628 198** **See Fld. 5/10**

## 6/20. TOXICOLOGY

**AD-628 048 Fld. 6/20**
**CFSTI Prices: HC $1.00 MF $0.50**
*AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO*
**THE EFFECT OF INJECTED MONOMETHYLHYDRAZINE ON PRIMATE PERFORMANCE.**
Final rept.,
by Herbert H. Reynolds, Henry W. Brunson, and Kenneth C. Back. Sep 65, 25p. Rept. no. AMRL-TR-65-82,
Proj. AF-6302, Task 630202,
Unclassified report

Prepared in cooperation with Aeromedical Research Lab. (6571st), Holloman AFB, N. Mex.

Descriptors: (*Methyl hydrazines, Toxicity), (*Performance tests, Toxic tolerances), Monkeys, Central nervous system, Dosage

Nine macaque monkeys were injected on two occasions with either 2.5 or 5.0 mg/kg of monomethylhydrazine (MMH). Operant task performance was measured, and clinical symptoms were noted. No difference in performance resulted from the two dosage levels, but there was a greater incidence of clinical symptoms in those subjects exposed to 5.0 mg/kg. In over half the cases a performance decrement preceded clinical symptoms, but in no instance did clinical symptoms precede a performance decrement. In 3/18 cases clinical symptoms did appear without a performance decrement, but in 4/18 cases a performance decrement occurred in the absence of clinical symptoms. When initial 2.5 or 5.0 mg/kg injections are made one might predict that performance decrements will occur between 1 and 2 hours and clinical symptoms between 2 and 2.5 hours in about half the subjects. A second exposure might be expected to produce performance decrements between 1 and 2 hours and clinical symptoms between 2 and 3 hours in the majority of subjects. If a subject is influenced by MMH, clinical symptoms will likely disappear between 3 and 9 hours following injection, and performance should return to baseline level between 3 and 30 hours. (Author)

**AD-628 176 Fld. 6/20, 6/3**
*NAVAL MEDICAL RESEARCH UNIT NO 4 GREAT LAKES ILL*
**CYTOTOXICITY OF HUMAN SERA IN TISSUE CULTURE SYSTEMS,**
by David W. Beno, Ralph I. Lytle, and Earl A. Edwards. 1965, 4p.
Unclassified report

*Availability: Published in Bacteriological Proceedings v135 1965. Copies to DDC users only.*

Descriptors: (*Blood serum, Toxicity), (*Tissue culture, Toxins + antitoxins), Cells (Biology), Serum albumins, Electrophoresis, Adenoviruses

While performing adenovirus neutralization tests in micro-titer plates, 148 (84%) of 176 heat-inactivated human sera exhibited cytotoxicity for HEp-2 cells at a 1:2 dilution. Titers ranged from 1:2 to 1:128 in 'well' and ill individuals. Curtain electrophoretic analysis indicated that toxic factor moved with the prealbumin fraction. Presence in prealbumin was confirmed by Ouchterlony tests against prealbumin antisera and by disc electrophoresis methods. For further confirmation, 15 sera from three persons with varying levels of cytotoxicity for HeLa, HEp-2, KB, and WI38 cell lines were treated by ammonium sulfate precipitation, and two other highly toxic sera were submitted to curtain electrophoresis. The fractions were then tested for cytotoxicity in HeLa and HEp-2 cell lines. Toxicity was not demonstrated by any of the globulins that were separated from the 17 sera. It was concluded that the toxic substance was a prealbumin possibly associated with some physiological change in the human body. (Report quoted in its entirety)

**AD-628 313 Fld. 6/20**
**CFSTI Prices: HC $2.60 MF $0.50**
*CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD*
**PHARMACOTOXIC EVALUATION OF NINE VEHICLES ADMINISTERED INTRAPERITONEALLY TO MICE.**
Rept. for May 64-Aug 65,
by Elmer G. Worthley, and Donald C. Schott.
Dec 65, 24p. Rept. no. CRDLR-3348,
Proj. DA-1C622401A097,
Unclassified report

Descriptors: (*Solvents, Toxicity), Steroids, Alcohols, Methyl cellulose, Vinylpyrrolidone, Electrolytes (Physiology), Water, Sulfoxides, Glycols, Ethanols, Mice, Polymers

The purpose of the present study was to determine the LD100 (lethal dose for 100% of the test population), LD50 (lethal dose for 50% of the test population), and ED0 (highest dose at which no effects are seen in any of the test population) for intraperitoneal injections of nine solvents into mice. A comparison of the toxicity (ED0, LD50, and LD100) of these solvents showed their descending order of toxicity to be: (1) 100% ethanol, (2) 100% polyethylene glycol-200, (3) 100% propylene glycol, (4) 100% dimethyl sulfoxide, (5) 100% sterol diluent, (6) distilled water, (7) 0.5% methylcellulose solution, (8) isotonic saline solution, and (9) 3.0% polyvinylpyrrolidone solution suspended in isotonic saline solution. (Author)

**AD-628 848** **See Fld. 6/6**

# Field 7-CHEMISTRY

## 7/2. INORGANIC CHEMISTRY

**AD-628 118 Fld. 7/2, 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*MALLINCKRODT CHEMICAL LAB HARVARD UNIV CAMBRIDGE MASS*
**MICROWAVE SPECTRUM, INTERNAL BARRIER, MOLECULAR STRUCTURE AND DIPOLE MOMENT OF DISILANYL FLUORIDE.**
Technical rept.,
by A. Peter Cox, and Ravi Varma. 1965, 25p.
Contract Nonr-1866 (14), Task 14,
Unclassified report

Descriptors: (*Silanes, Fluorides), (*Microwave spectroscopy, Silanes), (*Chemical bonds, Silanes), (*Molecular structure, Silanes), (*Dipole moments, Silanes), Molecular energy levels, Electron transitions, Isotopes, Molecular spectroscopy

The microwave spectra of five isotopic species of disilanyl fluoride (Si2H5F) were studied in the region 12-38 Gc/sec. Several of the ground state transitions are split into doublets, some into triplets, due to the coupling of internal and overall rotation. Analysis of the splittings gives a barrier value V-3 = 1048 plus or minus 40 cal/mole. Rotational constants were determined for molecules containing silicon-28, -29 and -30 isotopes in each positions, and were used to calculate the structure. Stark effect measurements yield mu-A = 0.934 D, mu-B = 0.850 D and a total dipole moment mu = 1.26 plus or minus 0.01 D inclined at an angle of 10 degrees to the SiF bond. (Author)

**AD-628 250 Fld. 7/2, 10/2, 7/4**
*ALBERTA UNIV EDMONTON DEPT OF CHEMISTRY*
**OXIDATION OF HYDROGEN ON NICKEL ELECTRODES IN SODIUM HYDROXIDE SOLUTION.**
Revised ed.,
by R. N. O'Brien, and K. V. N. Rao. 23 Aug 65, 4p.
Unclassified report

Revision of manuscript submitted 23 Jun 65.

*Availability: Published in Journal of the Electrochemical Society, v112 n12 p1245-8 Dec 1965. Copies to DDC users only.*

Descriptors: (*Hydrogen, Oxidation), (*Fuel cells, Oxidation-reduction reactions), Electrochemistry, Electrodes, Nickel, Electrolytes, Sodium compounds, Hydroxides, Anodes (Electrolytic cell), Electric current, Polarization, Nickel compounds, Canada

Results are reported of a study of the cause of the anodic limiting current observed during the oxidation of hydrogen to H2O on nickel in NaOH solution. The study serves to elucidate the mechanism of a reaction which is of interest in fuel cell technology.

**AD-628 331 Fld. 7/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*HOLMAN (JOHN F) CO INC WASHINGTON D C*

**CONTRIBUTIONS TO THE NATURE OF OXYHALIDES. III. THE NATURE OF CHLORINE DIOXIDE,**
by William Bray. Feb 66, 58p. Contract DA-44-009-AMC-930(T), Proj. DA-1-L-013-001-A-91-A
TT 66-60585 AERDL T-1815-65

Unclassified report

Trans. of mono. Beitrage zur Kenntnis der Halogensauerstoffverbind ungen. Abhandlung III-Zur Kenntnis des Chlordioxyds, 1906 p569-608.

Descriptors: (*Oxychlorides, Chemical properties), (*Chlorine compounds, Dioxides), (*Oxidizers, Oxychlorides), Solutions, Volumetric analysis, Hydrates, Chemical reactions, Chlorites, Decomposition, Molecular weight, Reaction kinetics, East Germany

The molecular weight of ClO2 in solutions of water and CCl4 corresponds to the simple formula. The author determined the solubility, the cryohydric point and the conversion point of the hydrate ClO2 + 8 H2O (+/- 1 H2O). The author succeeded in preparing a compound of ClO2 + H2O + CCl4 as well as solutions of chlorous acid. A striking similarity of ClO2 to the halogens and/or Cl2 both in chemical and physical relation was noted. It was possible to demonstrate that a primary chlorite formation takes place in the reduction of ClO2 to Cl', i.e., the separation of this intermediate stage was successful for reactions with I', NO'2 and Zn, whereas its occurrence in the reaction with FeSO4 and AsO3H3 was highly probable. Kinetic investigation of the decomposition of ClO2 in the presence of Cl' also led to the assumption of the primary occurrence of the chlorite stage. Analytical methods for the determination of the various oxychloride derivatives, specifically of ClO2 in addition to Cl2, ClO'3 and Cl' were developed and perfected. (Author)

**AD-628 826 Fld. 7/2**
*NORTH DAKOTA STATE UNIV FARGO*
**IRON (III) EXTRACTION BY NITROBENZENE -BENZENE MIXTURES,**
by R. L. Erickson, and R. L. McDonald. 1963, 1p. Contract AF-AFOSR-65-63, AFOSR T-1815-65

Unclassified report

Abstract only.

*Availability: Published in Proceedings of North Dakota Academy of Science v18 p112 1964. Copies to DDC users only.*

Descriptors: (*Iron, Solvent extraction), (*Solvent extraction, Iron), Organic solvents, Nitrobenzenes, Benzenes

It is well known that iron is extracted from aqueous hydrochloric acid by basic organic solvents as the complex acid, HFeCl4. However little is known about the solvation of this species in the organic phase. Some work with dibutyl ether as been reported and, recently, a series of papers concerning the solvation of acids by tributyl phosphate has appeared. It is the conclusion of these workers that for strong acids only the extracted hydronium ion is strongly solvated, usually with two or three solvent molecules. In the present work, the solvation of HFeCl4 by nitrobenzene in the inert diluent benzene has been studied by observing the variation of the distribution ratio with nitrobenzene concentration while all other variables are held constant. The extracted metal species existing in the organic phase at nitrobenzene concentrations greater than 3 M may be represented as HFeCl4 - 14PhNO2 - xH2O where x is being determined. At nitrobenzene concentrations below approximately 3.0 M the data are inconclusive. The large number of nitrobenzene molecules per metal atom may indicate that the anion is also solvated in this system. Further work, in progress, is necessary to clarify the situation. (Report quoted in its entirety)

**AD-628 060** **See Fld. 7/4**

**AD-628 251** **See Fld. 7/4**

**AD-628 261** **See Fld. 7/4**

**AD-628 269** **See Fld. 7/4**

**AD-628 276** **See Fld. 11/2**

**AD-628 282** **See Fld. 11/2**

**AD-628 413** **See Fld. 7/4**

**AD-628 455** **See Fld. 20/12**

**AD-628 523** **See Fld. 7/4**

**AD-628 569** **See Fld. 20/2**

**AD-628 746** **See Fld. 7/4**

**AD-628 750** **See Fld. 7/4**

**AD-628 759** **See Fld. 20/6**

## 7/3. ORGANIC CHEMISTRY

**AD-628 069 Fld. 7/3**
**CFSTI Prices: HC $3.00 MF $0.75**
*NEW MEXICO UNIV ALBUQUERQUE*
**THE SYNTHESIS OF ALKYLAMINOETHANETHIOLS SUBSTITUTED WITH HETEROCYCLIC MOIETIES AND THEIR DERIVATIVES.**
Final rept. 1 Aug 64-31 Dec 65,
by Raymond N. Castle. 31 Dec 65, 68p. Contract DA-49-193-MD-2645.

Unclassified report

Descriptors: (*N-heterocyclic compounds, Synthesis (Chemistry)), (*Thiols, Synthesis (Chemistry)), (*Amines, Synthesis (Chemistry)), Pyridines, Alcohols, Ethers, Chlorine compounds

**AD-628 137 Fld. 7/3**
**CFSTI Prices: HC $1.10 MF $0.50**
*OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS*
**REACTIONS OF CHLOROCARBONIUM IONS.**
Final rept., 1 Jan 64-31 Dec 65,
by Melvin S. Newman. 20 Jan 66, 6p. Rept. no. 1776-1,
Contract AF-AFOSR-569-64, Proj. AF-9762, Task 56964,
AFOSR 66-0175

Unclassified report

Descriptors: (*Phosphorus compounds, Chlorides), (*Chlorides, Chemical reactions), (*Ketones, Chemical reactions), Solvents, Halogenated hydracarbons, Chlorine compounds, Carbon tetrachloride, Chloroform

The objective of the program was to find out more about the reaction of phosphorus pentachloride with ketones of various structures since this type of reaction had, in the past, received very little attention. In the course of the work, a quite unusual phenomenon was observed, namely, that the reactions in carbon tetrachloride gave results different from those in methylene chloride. Since each of these solvents had been considered inert and of low dipole moment, the results were surprising, and therefore, very interesting. Since it was found by others that phosphorus pentachloride is dimeric, P2C110, in carbon tetrachloride and monomeric, PC15, in chloroform, the assumption was made that phosphorus pentachloride was monomeric in methylene chloride. Different mechanisms were proposed for the reactions of ketones with phosphorus pentachloride in carbon tetrachloride and methylene chloride. These mechanisms depend on the state of phosphorus pentachloride in these two solvents. This work has stimulated interest in the behavior of ketones with phosphorus pentachloride in other solvents. Thus, a wider perspective for future research in this area has resulted. (Author)

**AD-628 297 Fld. 7/3**
**CFSTI Prices: HC $1.60 MF $0.50**
*CALIFORNIA UNIV BERKELEY DEPT OF CHEMISTRY*
**MOLECULAR ORBITAL THEORY IN ORGANIC CHEMISTRY.**
Final rept. 1 Oct 61-30 Sep 65,
by Andrew Streitwieser,Jr., 30 Sep 65, 18p.
Contract AF-AFOSR-544-64,AF-AFOSR-62-175 Proj. AF-9762, Task 976201,
AFOSR 66-0185

Unclassified report

Descriptors: (*Molecular orbitals, Organic compounds), (*Aromatic compounds, Molecular orbitals), (*Polycyclic compounds, Molecular orbitals), Substitution reactions, Decomposition, Solutions, pH, Molecular energy levels, Acetic acids, Reaction kinetics, Fluorenes, Cesium compounds, Cyclohexanes, Amides, Field theory

In carbonium ion reactions, acetolysis of benzyl tosylates of 40C give the following relative rates: m-C1, 0.56; p-C1, 0.51; H, 1.00; p-F, 3.4; P-CH3, 60. The conductivity method developed is now being applied to polycyclic arylmethyltosylates for application of M.O. theory. In carbanion reactions, pK's were measured towards cesium cyclohexamide in cyclohexylamine of 14 hydrocarbons. Representative values are 9-phenylfluorene (18.49); indene, 19.93; fluorene, 22.74; triphenylmethane, 31.48; diphenylmethane, 33.09. HMO theory gives a poor correlation of these data. Exchange rates were measured for other hydrocarbons of interest with lithium and cesium cyclohexylamide and the reactions were demonstrated to involve carbanionic intermediates and to provide valid measures of hydrocarbon acidities. The exchange rates of polycyclic methylarene-ad's and of arene-d (or t)'s are poorly correlated by HMO theory. In the arene case, a simple inductive field effect model was successful. An attempted synthesis of octalene was unsuccessful. (Author)

**AD-628 402 Fld. 7/3**
*CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY*
**FORMATION OF A CYCLOPROPANE RING FROM AN ALPHA, BETA-UNSATURATED CARBOXYLIC ACID,**
by Roy T. Uyeda, and Donald J. Cram. 4 Feb 65, 2p. Contract AF-AFOSR-124-63, AFOSR 65-2378

Unclassified report

*Availability: Published in Journal of Organic Chemistry, v30 p2083 1965. Copies to DDC users only.*

Descriptors: (*Carboxylic acids, Reduction (Chemistry)), (*Cyclopropanes, Synthesis (Chemistry)), Chemical reactions, Benzenes, Proplonic acid, Aromatic compounds

In the course of the preparation of 3-phenyl-1-butanol by reduction of beta-methylcinnamic acid with lithium aluminum hydride besides the expected alcohol, considerable quantity of 1-methylphenylcyclopropane was isolated. It is probable that the two products have a common precursor, and that the relative yields are controlled by the amount of time the reaction is allowed to go before the reaction mixture is quenched. The scope and limitations of the reaction have not been examined, but, in principle, the reaction might be applicable to a broad range of alpha, beta-unsaturated carbonyl compounds. (Extracted)

**AD-628 454 Fld. 7/3**
*NOTRE DAME UNIV IND DEPT OF CHEMISTRY*
**CONFORMATIONAL ANALYSIS IN MOBILE CYCLOHEXANE SYSTEMS,**

by E. L. Eliel. 3 Jun 65, 14p. Contract AF-AFOSR-772-65,
AFOSR 65-2389

Unclassified report

*Availability: Published in Angewandte Chemie International Edition in English, v4 n9 p761-74 1965. Copies to DDC users only.*

Descriptors: (*Cyclohexanes, Chemical analysis), (*Stereochemistry, Cyclohexanes), Monocyclic compounds, Molecular energy levels, Thermochemistry, Chemical equilibrium, Reaction kinetics, Nuclear magnetic resonance

By 'Conformational Analysis' is meant the analysis of the physical and chemical properties of a compound in terms of its preferred 'conformations', i.e. rotational arrangements about single bonds. This particular review deals with cyclohexanoid compounds capable of existing in two or more stable conformations. (Author)

**AD-628 474 Fld. 7/3**
*BRITISH COLUMBIA UNIV VANCOUVER DEPT OF CHEMISTRY*
**ADDITION OF FLUOROACETYLENES TO GROUP V HYDRIDES,**
by W. R. Cullen, D. S. Dawson, and G. E. Styan.
19 Jul 65, 9p.

Unclassified report

*Availability: Published in Canadian Journal of Chemistry, v43 p3392-9 1965. Copies to DDC users only.*

Descriptors: (*Halogenated hydrocarbons, Alkynes), (*Alkynes, Chemical reactions), (*Hydrides, Chemical reactions), Organic nitrogen compounds, Organic phosphorus compounds, Arsines, Molecular isomerism, Nuclear magnetic resonance, Canada

Compounds of the type R2EH react readily with CF3CCCF3 to give R2EC (CF3)C (CF3)H (E = N,P,As), and with CF3CCH to give R2ECHCHCF3 (E = N,As) and R2EC (CF3)CH2 (E = As). The isomer distribution of the products is obtained from their n.m.r. spectra and the mechanism of the addition reaction is discussed. (Author)

**AD-628 622 Fld. 7/3, 7/4**
*SYRACUSE UNIV N Y STATE UNIV COLL OF FORESTRY*
**THE CHEMISTRY OF THE RADICAL ANION OF TETRAPHENYLETHYLENE,**
by R. C. Roberts, and M. Szwarc. 3 Aug 65, 7p.
Contract DA-ARO (D)-31-124-G521,
AROD 4617:1

Unclassified report

*Availability: Published in Journal of the American Chemical Society v87 n24 p5542-8 Dec 20 1965. Copies to DDC users only.*

Descriptors: (*Free radicals, Chemical properties), (*Aromatic compounds, Free radicals), Ions, Sodium compounds, Reaction kinetics, Electrical conductance, Dissociation, Thermochemistry, Enthalpy, Chemical equilibrium, Spectroscopy, Chemical reactions

The reaction of the disodium salt of tetraphenylethylene, T (2-), 2Na (+), with its parent hydrocarbon, T, was investigated spectrophotometrically and conductometrically in tetrahydrofuran in the temperature range +20 to -70C.

**AD-628 652 Fld. 7/3, 7/4**
*UNIVERSITY OF SOUTH FLORIDA TAMPA DEPT OF CHEMISTRY*
**ORGANOMETALLIC COMPOUNDS. V. KINETICS OF PHENYLTIN CLEAVAGE BY A CHELATING AGENT.**
Revised ed.,
by D. F. Martin, and R. D. Walton. 24 Jun 65, 6p. Contract DA-ARO (D)-31-124-G588, AROD 5200:2

Unclassified report

Revision of manuscript received 26 Apr 65. See also AD-623 071.

*Availability: Published in Journal of Organometallic Chemistry v5 p57-62 1966.*

Descriptors: (*Metalorganic compounds, Tin compounds), (*Tin compounds, Decomposition), (*Chelate compounds, Chemical reactions), Aromatic compounds, Chlorides, Quinolines, Reaction kinetics, Dissociation

The kinetics of tin-phenyl cleavage of diphenyltin dichloride by 8-quinolinol (HOx) in dimethyl sulfoxide were determined at 178-192C. The rate of formation of the product, Cl2Sn (Ox)2, is given by the expression, rate = k (obs)/ (C6H5)2SnC12/, where k (obs) = k1 + k2/HOx/squared. The two-term expression reflects a dissociative mechanism and a mechanism which involves formation and decomposition of C6H5SnCl2.2HOx. A mass-law retardation effect is demonstrated by the addition of chloride ion, though the addition of bromide ion causes no alteration in the rate. It appears that the second mechanism consists of a nucleophilic attack by 8-quinolinol followed by activation of electrophilic proton and incipient phenyl carbanion through coordination. (Author)

**AD-628 659 Fld. 7/3**
*MASSACHUSETTS UNIV AMHERST DEPT OF CHEMISTRY*
**2,3-DIPHENYLVINYLENE SULFONE,**
by Louis A. Carpino, and Louis V. McAdams,III.. 30 Aug 65, 1p. Contract DA-ARO (D)-31-124-G491,
AROD 2533:2

Unclassified report

*Availability: Published in Journal of the American Chemical Society, v87 p5804 1965. Copies to DDC users only.*

Descriptors: (*S-heterocyclic compounds, Synthesis (Chemistry)), Aromatic compounds, Ketones, Molecular structure

The synthesis of 2,3-diphenylvinylene sulfone is reported. It is the first example of a three-membered ring heterocycle which is potentially aromatic because of the possible involvement of d orbitals at the hetero atom. Application of the Ramberg-Backlund reaction to alpha-alpha-dibromodibenzyl sulfone using triethylamine in methylene dichloride gave in 70% yield the unusual sulfone, m.p. 116-126C dec. The infrared spectrum shows several strong bands in the regions generally associated with the asymmetric and symmetric stretching modes of the SO2 group. The n.m.r. spectrum exhibits only a complex multiplet centered at delta 7.55 due to the aromatic protons. Firm evidence for the presence of the three-membered ring was obtained by reduction of the double bond by means of aluminum amalgam. The unsaturated sulfone is remarkably more stable than the saturated analog. (Extracted)

**AD-628 733 Fld. 7/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*GLASGOW UNIV (SCOTLAND) DEPT OF CHEMISTRY*
**STUDIES IN RING EXPANSION,**
by G. L. Buchanan. 31 Dec 64, 35p. Rept. no. Scientific-2,
Contract AF-EOAR 36-63,

Unclassified report

Descriptors: (*Polycyclic compounds, Synthesis (Chemistry)), (*Ketones, Chemical reactions), Esters, Spectra (Infrared), Band spectrum, Alkaloids, Great Britain

In contrast to an enolizable dimedone derivative, the non-enolizable 2-methyl-2- (2'-benzoyl ethyl)-dimedone was cyclised to 1-methyl-4-phenyl bicyclo (3,3,1)non-3-en -8.9-dione. The infrared spectrum of this and other non-enolizable beta-diketones shows a split carbonyl band. This phenomenon was investigated. A new cycloheptene synthesis previously reported was applied to the synthesis of a compound related to the alkaloid colchicine. (Author)

**AD-628 060 See Fld. 7/4**

**AD-628 086 See Fld. 7/5**

**AD-628 097 See Fld. 13/10**

**AD-628 264 See Fld. 6/1**

**AD-628 283 See Fld. 6/1**

**AD-628 410 See Fld. 7/4**

**AD-628 420 See Fld. 6/1**

**AD-628 569 See Fld. 20/2**

**AD-628 571 See Fld. 7/4**

**AD-628 722 See Fld. 7/4**

**AD-628 862 See Fld. 7/4**

## 7/4. PHYSICAL CHEMISTRY

**AD-628 059 Fld. 7/4, 4/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS OPTICAL PHYSICS LAB*
**OZONE ABSORPTION IN THE 9.0 MICRON REGION.**
Physical sciences research papers,
by Shepard A. Clough, and Francis X. Kneizys.
Nov 65, 86p. Rept. no. PSRP-170,
Proj. AF-7670, Task 767003,
AFCRL 65-862

Unclassified report

Descriptors: (*Ozone, Absorption spectrum), (*Infrared spectroscopy, Ozone), Atomic energy levels, Electron transitions, Line spectrum, Tables

The absorption of ozone in the 9.0 micron region of the infrared spectrum, due to transitions from the ground state to the v-1 and v-3 states, was studied. The report gives the numerical results of an analysis of the spectrum including transition frequencies and perturbed intensities ordered by quantum number and by frequency. Calculated and observed spectral contours are included. (Author)

**AD-628 060 Fld. 7/4, 7/2, 7/3**
**CFSTI Prices: HC $2.00 MF $0.50**
*OREGON STATE UNIV CORVALLIS DEPT OF CHEMISTRY*
**STRUCTURES AND DYNAMICS OF MOLECULES BY ELECTRON DIFFRACTION.**
Final rept., 1 Jan 60-31 Dec 64,
by Kenneth Hedberg, and Lise Hedberg. 10 Nov 65, 47p. Contract AF 49 (638)-783,AF-AFOSR-281-63A Proj. AF-9710, Task 971003,
AFOSR 65-2231

Unclassified report

Descriptors: (*Molecular structure, Electron diffraction analysis), (*Molecular properties, Electron diffraction analysis), (*Electron diffraction analysis, Molecular properties), Gases, Potential theory, Chemical bonds, Dienes, Cyclooctane derivatives, Nitrogen compounds, Oxides, Fluorine compounds, Sulfonates, Phosphorus compounds, Chlorides, Arsenic compounds, Bromides, Chemical bonds

The program of study was undertaken for the purpose of (1) determining the structure of chemically interesting molecules, by means of gaseous electron diffraction analysis, in order to better understand their chemical properties; and (2) determining the potential functions of certain molecules by combining the electron-diffraction measured amplitudes of vibration with the known vibrational frequencies. Computer programs for structural analysis were devised, and a diffraction apparatus was constructed. Molecular structure studies were carried out on disiloxane, disilyl sulfide, cyclopropane, diboron tetrachloride, cyclo-octadiene-1,5, 2,3-dimethylbutadiene, dinitrogen pentoxide, fluorine fluorosulfonate. Molecular dynamics studies were performed on phosphorus trichloride, arsenic tribromide, and nitrogen dioxide.

**AD-628 066 Fld. 7/4, 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*GENERAL ATOMIC SAN DIEGO CALIF*
**INTERACTIONS BETWEEN HYDROGEN AND OXYGEN ATOMS AND SURFACES.**
Annual technical summary rept. 1 Oct 64-30 Sep 65,
by J. N. Smith,Jr.. 25 Oct 65, 13p. Rept. no. GA-6749,
Contract AF 49 (638)-1435, Proj. AF-9783,GA-463 Task 978301,
AFOSR 65-2310

Unclassified report

See also AD-608 592.

Descriptors: (*Particle beams, Superaerodynamics), (*Hydrogen, Particle beams), (*Oxygen, Particle beams), Surfaces, Silver, Molecular beams

Research is summarized on molecular-beam scattering experiments performed under well-defined and reproducible surface conditions. The microscopic details of the gas-surface interaction mechanism are discussed.

**AD-628 082 Fld. 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*COLUMBIA RADIATION LAB NEW YORK*
**THE PHYSICS AND CHEMISTRY OF GASES AT HIGH TEMPERATURES.**
Final rept. 1 Nov 63-31 Oct 65,
by P. Kusch. Nov 65, 11p. Contract AF-AFOSR-330-63, Proj. AF-9767 Task 976701,
AFOSR 66-0166

Unclassified report

Descriptors: (*Gases, High-temperature research), (*Molecular beams, Scattering), (*Molecular spectroscopy, Gases), Molecular association, Potassium, Potassium compounds, Chlorides, Masers, Spectroscopy, Microwave spectroscopy, Cesium, Magnetic fields, Spectrum (Infrared), Ammonia, Lithium compounds, Ethers, Carbon compounds, Sulfides

An extensive study has been made of the scattering of velocity-selected beams of atomic potassium and potassium chloride by argon and by molecular nitrogen. A detailed investigation of certain hyperfine structures in molecules of deuterated ammonia was made in a beam maser spectrometer. A conventional microwave spectrometer, capable of operation over a wide range of temperatures, was used to study the microwave spectrum of lithium chloride in detail and that of methyl vinyl ether. A reinvestigation of the spectrum of molecular cesium in the optical region was started. The technique of magnetic rotation spectra is being applied to a study of carbon disulfide.

**AD-628 089 Fld. 7/4, 9/1, 20/12, 3/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*COLUMBIA RADIATION LAB NEW YORK*
**RESEARCH INVESTIGATION DIRECTED TOWARD EXTENDING THE USEFUL RANGE OF THE ELECTROMAGNETIC SPECTRUM.**
Progress rept. no. 12 (Quarterly progress rept. no. 4), 16 Sep-15 Dec 65,
by R. Novick. 15 Dec 65, 75p. Rept. no. CU-12-65-AMC-00099 (E),
Contract DA-28-043-AMC-00099 (E), Proj. DA-1A0-10501-B010,

Unclassified report

Continuation of Contract DA-36-039-sc-90789, see also AD-467 754.

Descriptors: (*Atomic spectroscopy, Microwave equipment), (*Molecular spectroscopy, Spectrum analyzers), (*Solid state physics, Microwave equipment), (*Radio astronomy, X-ray spectroscopy), Microwave spectroscopy, Gas ionization, Radioactive isotopes, Masers, Lasers, Microwave frequency, Planetary atmospheres

Specular reflection of x rays by total reflection can be produced at grazing incidence from a uniform gold film evaporated onto annealed glass. Two designs for utilizing this effect to produce large-area x-ray gathering systems are presented. A magnetic resonance rf spectrometer is being constructed to study the hyperfine structure of the metastable states in potassium, rubidium, and lithium. With this spectrometer, magnetic quenching rather than inhomogeneous field deflection will be used for state selection. A second optical delay line was added to the existing photon -echo apparatus to provide a third excitation pulse. In addition to two-pulse echoes of the type previously studied, this arrangement produces a 'stimulated' photon echo delayed from the third pulse by the time interval between the first two pulses. A precise measurement of the resonant self-broadening of the (6s26p7s)3P1 (0) state of lead has determined the collision-induced reaction rate to be 3.2 (1) x 10 to the -8th power cc/sec x N.

**AD-628 120 Fld. 7/4, 20/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*MALLINCKRODT CHEMICAL LAB HARVARD UNIV CAMBRIDGE MASS*
**A NOTE ON THE VARIATION-PERTURBATION METHOD FOR EXCITED STATES.**
Technical rept.,
by William H. Miller. 1964, 6p. Contract Nonr-1866 (14) Task 14,

Unclassified report

Descriptors: (*Excitation, Perturbation theory), (*Perturbation theory, Calculus of variations), Quantum mechanics, Matrix algebra

Sinanoglu has shown that the variation-perturbation method yields an upper bound to the second-order perturbation energy for an excited state if the form of the trial function is suitably restricted. It is shown that the restriction on the trial function can in principle be relaxed from the one specified by Sinanoglu. From this more general form of the constraint it is easy to see why approximate calculations that impose no restrictions at all on the trial function are very likely to give a second-order perturbation energy which lies above the true value. (Author)

**AD-628 138 Fld. 7/4**
**CFSTI Prices: HC $1.10 MF $0.50**
*WASHINGTON UNIV ST LOUIS MO DEPT OF PHYSICS*
**PARAMAGNETIC RESONANCE ABSORPTION OF FREE RADICALS AND OTHER SUBSTANCES.**
Final technical rept., 1 Oct 64-30 Sep 65,
by R. E. Norberg, S. I. Weissman, J. Townsend, N. Goldman, and B. Mehrotra. 21 Oct 65, 5p.
Contract AF-AFOSR-771-65,
AFOSR 66-0167

Unclassified report

Descriptors: (*Free radicals, Absorption spectrum), (*Paramagnetic resonance, Free radicals), Nuclear magnetic resonance, Chemical reactions, Atomic energy levels, Organoboranes, Manganese compounds, Fluorides, Single crystals, Aluminum, Copper, Fluorine, Nuclear spins, Neon

Results of studies in the following areas are briefly summarized: Spectra of triplets and biradicals; Effect of optical configuration on rates of electron transfer; intramolecular migration of triplet excitation; triarylboron free radicals; ESR or MnF6 ions in potassium and ammonium fluogermanates; pulsed NMR in Al and Cu single crystals; spin-spin relaxation of F-19 in LaF3 single crystals; pulsed NMR Ne-21 in liquid and solid neon.

**AD-628 228 Fld. 7/4, 21/2, 20/9**
**CFSTI Prices: HC $4.60 MF $0.50**
*LASH MILLER CHEMICAL LABS UNIV OF TORONTO (ONTARIO)*
**DISTRIBUTION OF ENERGY IN THE PRODUCTS OF REACTIONS UNDER FLAME AND RELATED CONDITIONS.**
Scientific rept.,
by J. M. Deckers. Oct 64, 42p. Rept. no. Scientific-1,
Contract AF-AFOSR-375-63,
AFOSR 65-2723

Unclassified report

Descriptors: (*Glow discharges, Chemical reactions), (*Flames, Chemical reactions), (*Oxygen, Chemical reactions), (*Nitrogen, Glow discharges), (*Hydrocarbons, Flames), Electric fields, Plasma medium, Atoms, Gas flow, Recombination reactions, Continuous spectrum, Carbon monoxide, Combustion, Reaction kinetics, Energy, Canada

Contents: Measurement of the electrical field in D.C. flow discharges through oxygen, nitrogen and oxygen -nitrogen mixtures, by J. M. Deckers, H. Rundel, B. Miller, R. Sova, L. Higgins, B. Stansfield; Production of O atoms in the discharge, by J. M. Deckers, R. M. Yealland, K. Rabone; Emission spectrum of oxygen containing small amounts of carbon monoxide, by J. M. Deckers, M. Ailliet, Joan S. Nash; Influence of pressure burner size and composition upon the intensity of emission of hydrocarbon-oxygen flames, by J. M. Deckers and G. Ndallio.

**AD-628 229 Fld. 7/4, 20/6**
*OKLAHOMA UNIV NORMAN DEPT OF PHYSICS*
**COLLISIONAL TRANSFER OF EXCITATION ENERGY IN HELIUM,**
by Robert M. St, and Tsu-Wei Nee. 2 Sep 64, 7p.
Contract AF-AFOSR-252-63,
AFOSR 65-2824

Unclassified report

*Availability: Published in Journal of the Optical Society of America, v55 n4 p426-32 Apr 1965. Copies to DDC users only.*

Descriptors: (*Helium, Excitation), (*Atomic energy levels, Helium), Transport properties, Electron transitions, Functions, Probability

Recent absolute measurements of many helium excitation functions at low pressure and of the singlet and triplet D functions at several pressures allowed an extension and upgrading of the multiple-state-transfer process. Atoms excited to an nP singlet level are converted to a mixed singlet-triplet F state by an atomic collision. Low-lying singlet and triplet D levels are fed by the many F states thus populated. Apparent excitation functions were computed by machine for the 3D triplet, 4D triplet and 4D singlet, states and compared with the experimental excitation functions. The computed curves best match the experimental curves when it is assumed that: (a) the transfer cross section for the nth set of singlet P-F states is proportional to n to the 1st or 2nd powers, and (b) the singlet F3 and triplet F3 components of the mixed state are active in the transfer-cascade processes, while the triplet F2,4 states are inactive. The energy is primarily transferred through n1P-nF sets of states with n < or = 15. (Author)

**AD-628 239 Fld. 7/4, 20/9**
*NEW YORK UNIV N Y*
**AUTOIONIZATION STATES OF H (-) BELOW THE N=2 LEVEL OF H,**
by J. F. Walker, and A. Temkin. 11 May 65, 4p.

Unclassified report

Prepared in cooperation with Goddard Space Flight Center, National Aeronautics and Space Administration, Greenbelt, Md. Supported by ONR and Army Research Office (Durham).

*Availability: Published in The Physical Review v140 n5A pA1520-23 29 Nov 1965. Copies to DDC users only.*

Descriptors: (*Gas ionization, Hydrogen), (*Hydrogen, Gas ionization), Electrons, Scattering, Ions, Atomic energy levels, Hamiltonian, Resonance, Wave functions

The resonances below the inelastic (n=2) threshold of electron-hydrogen scattering are examined by the projection-operator technique of Feshbach. This technique converts the problem to an eigenvalue problem for a projected Hamiltonian in which the autoionization levels of H (-) become true bound states. The number of levels of this problem is found to be infinite and cluster at the n=2 level of H. The relative spacings of the levels are identical to the resonances in e-H scattering as derived by Gailitis and Damburg. (Author)

**AD-628 251 Fld. 7/4, 11/6, 7/2**
*TORONTO UNIV (ONTARIO) DEPT OF METALLURGY AND MATERIALS SCIENCE*
**THERMODYNAMIC AND ELECTROCHEMICAL PROPERTIES OF ZIRCONIUM CHLORIDES IN ALKALI CHLORIDE MELTS,**
by B. Swaroop, and S. N. Flengas. 4 Jun 65, 15p.

Unclassified report

*Availability: Published in Canadian Journal of Chemistry v44 p199-213 1966. Copies to DDC users only.*

Descriptors: (*Zirconium compounds, Chlorides), (*Thermodynamics, Zirconium compounds), (*Electrochemistry, Zirconium compounds), Alkali metal compounds, Potassium compounds, Sodium compounds, Chemical equilibrium, Complex compounds, Solutions, Zirconium, Electrodeposition, Voltage, Canada

The liquidus curves in the binary equilibrium phase diagrams of the systems, ZrCl2-MCl, and ZrCl3-MCl, where M is potassium or sodium, have been determined where possible. The electrochemical properties of the dilute solutions of zirconium di-, tri-, and tetra-chlorides in the temperature range 670C to 750C, were investigated by reversible electromotive force measurements. From the results various equilibria between zirconium metal and the solutions of zirconium tri- and tetra-chlorides, respectively, were determined. Activity calculations indicate that zirconium tetrachloride is heavily complexed in these melts. (Author)

**AD-628 261 Fld. 7/4, 7/2, 20/10**
*JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB*
**A STUDY OF THE VALENCE ELECTRON APPROXIMATION: APPLICATION TO LIH,**
by J. D. Stuart, and R. P. Hurst. 11 Mar 65, 6p.
Contract NOw-62-0604-c,
AFOSR 65-2803

Unclassified report

Prepared in cooperation with State Univ. of New York, Buffalo, Dept. of Physics, Grant AF-AFOSR-191-63.

*Availability: Published in Molecular Physics v9 n3 p265-70 1965. Copies to DDC users only.*

Descriptors: (*Electrons, Valence), (*Valence, Wave functions), (*Molecular orbitals, Lithium compounds), (*Lithium compounds, Hydrides), Molecular energy levels, Dipole moments, Atomic orbitals

Using the valence bond approach and a six-term wave function valence electron calculations are made of the energy and dipole moment of lithium hydride. Comparisons are then made with previous two- and with four-electron results. It is found that reasonable agreement with four-electron calculations of the dipole moment is obtained when the valence orbitals are made orthogonal to the orbitals of the neglected lithium inner shell 1s electrons and that an approximate variational theorem for the energy is then valid. On the other hand, when one fails to require the valence orbitals to be orthogonal to the inner shell an energy lower than the 'experimental' energy can be obtained and the computed dipole moment is in poor agreement with the computed four-electron moment and with the experimentally determined moment. Finally, as with four-electron calculations, hybridization with the 2p covalent structure is necessary to give a reasonable dipole moment. (Author)

**AD-628 269 Fld. 7/4, 7/2**
*INDIANA UNIV BLOOMINGTON DEPT OF CHEMISTRY*
**ELECTRONIC COMMUTATOR DETERMINATION OF E OF FORMATION AND RELATED THERMODYNAMIC QUANTITIES FOR MOLTEN LEAD CHLORIDE,**
by Theodore B. Warner, and Ralph L. Seifert. 16 Nov 63, 6p. Contract AF 49 (638)-313,
AFOSR 65-2099

Unclassified report

*Availability: Published in Journal of Physical Chemistry v69 n3 p1034-9 Mar 1965. Copies to DDC users only.*

Descriptors: (*Lead compounds, Chlorides), (*Salts, Electrical properties), (*Thermochemistry, Lead compounds), Heat of formation, Entropy, Enthalpy, Specific heat, Thermodynamics, Errors

The electronic commutator method for determining E of formation of molten halides was improved and applied to obtain the following equations for E, delta G, delta H, delta S, and delta Cp of formation of liquid lead chloride in the temperature range 493-866C. The equation for E reproduces the data within the experimental precision of 0.2 mv. The larger error limits in brackets are based on consideration of maximum probable temperature inhomogeneity in the melt and other possible systematic errors. The figures in brackets are average standard errors calculated for t = 493-750C and 866C, respectively; X = (t - 700/100. E (mv.) = 1158.90 - 54.11X + 0.833Xsq + 0.062Xcu. + 0.116X to the 4th power/plus or minus 0.8 mv., plus or minus 1.2 mv./. Delta G (kcal./mole) = - 53.451 + 2.496X - 0.038Xsq - 0.0029Xcu - 0.0054X to the 4th power/ plus or minus 0.035 kcal., plus or minus 0.053 kcal./. Delta H (kcal./mole = -77.737 + 0.748X + 0.122Xsq + 0.2140Xcu + 0.0160X to the 4th power/plus or minus 0.12 kcal., plus or minus 0.24kcal./. Delta S (e.u.) = -24.957 + 0.768X + 0.086Xsq + 0.2140Xcu./plus or minus 0.14 e.u., plus or minus 0.19 e.u./. Delta Cp (cal./mole deg.) = 10.41 + 0.34X - 0.075Xsq /plus or minus 0.47 cal., plus or minus 0.76 cal./. (Author)

**AD-628 348 Fld. 7/4**
*OKLAHOMA UNIV NORMAN*
**LIFETIME STUDIES OF THE RADIATIVE DISSOCIATION OF EXCITED H2,**
by R. G. Fowler, and T. M. Holzberlein. 22 Feb 65, 4p. Contract AF 49 (638)-1404,
AFOSR 65-2879

Unclassified report

*Availability: Published in The Journal of Chemical Physics, v42 n10 p3723-4 May 15 1965. Copies to DDC users only.*

Descriptors: (*Dissociation, Hydrogen), Molecular energy levels, Excitation, Electron transitions, Probability

**AD-628 349 Fld. 7/4**
*JOHNS HOPKINS UNIV BALTIMORE MD*
**FREE-ION AND CRYSTALLINE SPECTRA OF PR (3+) (PR IV),**
by H. M. Crosswhite, G. H. Dieke, and William J. Carter. 12 May 65, 10p. Contract AF 49 (638)-1497,
AFOSR 65-2804

Unclassified report

*Availability: Published in The Journal of Chemical Physics, v43 n6 p2047-54 15 Sep 1965. Copies to DDC users only.*

Descriptors: (*Praseodymium, Line spectrum), (*Atomic spectroscopy, Praseodymium), (*Atomic energy levels, Praseodymium), Ions, Crystals, Electron transitions, Hyperfine structure, Atomic orbitals, Fluorescence

The spectrum of the free tripositive praseodymium ion (Pr IV) was obtained under high resolution between 1200 A and the infrared. The analysis yielded all 49 levels of the four lowest configurations 4f (2), 4f5d, 4f6s, 4f6p. A comparison with the crystal levels of Pr (3+) in various lattices shows a depression of up to 5% in the anhydrous chlorides. (Author)

**AD-628 351 Fld. 7/4, 20/13**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF*
**DISCONTINUITIES IN THE SURFACE STRUCTURE OF ALCOHOL-WATER MIXTURES,**
by B. L. Dunicz. 4 Nov 65, 49p. Rept. no. USNRDL-TR-951,
Proj. SR-011-01-01, Task 0401,

Unclassified report

Descriptors: (*Alcohols, Surface tension), (*Water, Surface tension), (*Surface tension, Measurement), Methanols, Ethanols, Mixtures, Surface properties, Concentration (Chemistry), Thermodynamics

Interpretations vary regarding relationships between surface tension and concentrations of binary liquid solutions. These interpretations are based upon a scanty number of observations and do not take into account the possibility that the mutual molecular arrangement of the components on the surface may tend to follow some particular patterns, which undergo modifications at certain critical compositions of the liquids. Surface tension determinations were obtained by the capillary rise method for two systems: methyl alcohol-water, and ethyl alcohol-water, at 25C, throughout the whole range of concentrations, with over 80 experimental points obtained for each system. Plots of the Langmuir isotherm confirmed the validity of the proposed conjecture. The plots of the MeOH-H2O and EtOH-H2O consist of twelve and eleven rectilinear segments, respectively. A detailed interpretation of the data is presented.

**AD-628 382 Fld. 7/4**
**CFSTI Prices: HC $1.60 MF $0.50**
*AIR FORCE MATERIALS LAB WRIGHT-PATTERSON AFB OHIO*
**THE EFFECT OF CHEMICAL COMBINATION ON THE SOFT X-RAY K EMISSION SPECTRUM OF BORON.**
Summary rept., Mar-Jun 65,
by David W. Fischer, and William L. Baun. Dec 65, 18p. Rept. no. AFML-TR-65-360,
Proj. AF-7367, Task 736702,

Unclassified report

Descriptors: (*X-ray spectrum, Boron), (*Boron, Chemical reactions), Boron compounds, Nitrides, Oxides, Excitation

Major changes due to chemical combination are observed in the soft X-ray K emission spectrum of boron. The largest changes occur between elemental boron, boron nitride (BN) and boron oxide (B2O3). Spectra obtained from these compounds using a stearate crystal are compared with results of previous workers from a ruled grating. Points of agreement and differences are noted. The spectra were obtained from a flat crystal vacuum spectrometer using a flow proportional counter and electron excitation. (Author)

**AD-628 395 Fld. 7/4**
*CORNELL UNIV ITHACA N Y DEPT OF CHEMISTRY*
**DEPENDENCE OF THE PROBABILITIES OF VIBRATIONAL DE-EXCITATION ON INTERACTION POTENTIALS,**
by Hyung Kyu Shin. 1 Jul 64, 4p. Contract AF-AFOSR-324-63,
AFOSR 65-2955

Unclassified report

*Availability: Published in The Journal of Chemical Physics v42 n1 p59-62 1 Jan 1965. Copies to DDC users only.*

Descriptors: (*Electron transitions, Potential theory), Probability, Relaxation time, Molecular properties, Vibration, Quantum mechanics, Kinetic theory

Using the WKB semiclassical approximation, the dependence of the probability of vibrational deexcition on the assumed form of the interaction potential is discussed. The asymptotic results show that the Morse and Lennard-Jones potentials have, respectively, two and three correction terms in the exponential part. The magnitudes of the correction terms are important compared to the leading term. The exact form of the leading term is also dependent upon the interaction potential. (Author)

**AD-628 406 Fld. 7/4**
*OKLAHOMA UNIV NORMAN DEPT OF PHYSICS*
**ELECTRON EXCITATION CROSS SECTION OF THE 3-DOUBLET-S TO 3-DOUBLET-P TRANSITION OF SODIUM,**
by Larry L. Barnes, Neal F. Lane, and Chun C. Lin. 17 Aug 64, 4p. Contract AF-AFOSR-252-63,
AFOSR 65-2882

Unclassified report

*Availability: Published in The Physical Review, v137 n2A pA388-91 Jan 18 1965. Copies to DDC users only.*

Descriptors: (*Sodium, Excitation), (*Atomic energy levels, Sodium), Electron bombardment, Electron transitions, Probability, Differential equations, Integration, Matrix algebra, Numerical methods + procedures

The cross section of the 3-doublet-S to 3-doublet-P transition of sodium produced by electron impact was calculated by performing a numerical integration of the set of three-channel differential equations. By means of this numerical procedure, it is no longer necessary to replace the nondiagonal matrix elements of the interaction potential by their asymptotic forms and to neglect the diagonal part of the interaction-potential matrix, as was done in the previous calculations. The cross sections calculated by this numerical scheme are smaller than those of the previous work, and the difference can be ascribed to the use of the true interaction potentials rather than their asymptotic forms. As outline of the general formulation of the numerical method for an n-channel case is given. (Author)

**AD-628 407 Fld. 7/4, 20/6**
*OKLAHOMA UNIV NORMAN DEPT OF PHYSICS*
**THEORY OF THE EXCITATION OF THE 4686-A LINE OF HE (+) BY ELECTRON IMPACT,**
by Edward T. P. Lee, and Chun C. Lin. 16 Nov 64, 4p. Contract AF-AFOSR-252-63,
AFOSR 65-2954

Unclassified report

*Availability: Published in The Physical Review, v138 n2A pA301-4 Apr 19 1965. Copies to DDC users only.*

Descriptors: (*Helium, Excitation), (*Atomic energy levels, Helium), Gas ionization, Electron bombardment, Electron transitions, Probability, Ions, Line Spectrum

The cross sections for the production of He (+) ion in the 4S state by single-electron collisions with neutral helium atoms in the ground state were calculated by the Born approximation at various incident-electron energies from 200 to 450 eV. By using the ionization-excitation cross sections of the 4P and 4D states calculated by Dalgarno and McDowell and by extending their calculations to 4F, the cross sections of the excitation of the n = 4 to n = 3 transitions of He (+) (4686 A) were computed. It was found that the transition 4S to 3P contributes about 90% of the total radiation of the various members of the n = 4 to n = 3 group. The theoretical cross sections of the 4686-A radiation agree with the experimental values to within 15%. It is concluded that the observed 4686-A radiation can be ascribed mainly to direct ionizationexcitation to the n = 4 states of He (+) by single-electron impact, and no evidence is found for any indirect excitation mechanism which is responsible for a significant portion of the population of the 4S state of He (+). (Author)

**AD-628 410 Fld. 7/4, 7/3**
*STATE UNIV OF NEW YORK BUFFALO DEPT OF CHEMISTRY*
**DIELECTRIC CONSTANT OF HYDROGEN-BONDED LIQUIDS. IV. EQUILIBRIUM AND RELAXATION STUDIES OF HOMOLOGOUS NEO-ALCOHOLS,**
by W. Dannhauser, L. W. Bahe, R. Y. Lin, and A. F. Flueckinger. 8 Mar 65, 12p. Contract AF-AFOSR-271-63 ,NSF-GE-3074
AFOSR 65-2384

Unclassified report

*Availability: Published in The Journal of Chemical Physics, v43 n1 p257-66 Jul 1 1965. Copies to DDC users only.*

Descriptors: (*Alcohols, Dilectric properties), (*Dilectric properties, Alcohols), Elthalpy, Entropy, Chemical bonds, Relaxation time, Polarization, Nuclear magnetic resonance, Spectroscopy, Tables, Graphics

The dielectric constants of H- (CH2)n-C (CH3)2-CH2OH with n=1, 2, 3, 4, 6, and 8 were measured from about -70 to 100C with test frequencies 0.05< f<2X10 to the 5th power kc/sec. The equilibrium dielectric constant is analyzed in terms of associative, hydrogen-bond equilibria as deduced from the temperature variation of the Kirkwood correlation factor and delta H and delta S of hydrogen bonding are estimated. Dielectric relaxation was defined over several decades of time. The principal dispersion locus is Debye-like irrespective of wide variations of the apparent degree of association and delta H double dagger and delta S double dagger for relaxation are similar for all species. The relation of dielectric relaxation to equilibrium liquid structure is discussed and evidence for rotational mobility in solid neopentanol and neohexanol is presented. (Author)

**AD-628 413 Fld. 7/4, 7/2**
*TEXAS A AND M UNIV COLLEGE STATION DEPT OF PHYSICS*
**THE SPECTRA OF H20 AND D20 IN THE VACUUM ULTRAVIOLET,**
by S. Bell. 23 Dec 64, 7p. Contract AF-AFOSR-326-63,
AFOSR 65-2863

Unclassified report

*Availability: Published in Journal of Molecular Spectroscopy v16 n1 p205-13 May 1965. Copies to DDC users only.*

Descriptors: (*Water vapor, Spectra (Visible + ultraviolet)), (*Heavy water, Spectra (Visible + ultraviolet)), (*Ultraviolet spectroscopy, Water), Molecular spectroscopy, Band spectrum, Chemical bonds, Vibration, Electron transitions, Intensity

Vibrational analyses are made of two band systems of water vapor with origins at 1240 and 1219 A. The fundamental frequencies of H2O and D2O are determined for the excited electronic states of both systems. Franck-Condon calculations based on estimated intensities yield increases in geometrical parameters of delta-r = 0.065 A and 2 delta-alpha = 5.2 degrees for the 1240-A system, and delta-r = 0.067 A and 2 delta-alpha = 8.5 degrees for the 1219-A system. (Author)

**AD-628 426 Fld. 7/4, 20/1**
*IOWA ENGINEERING EXPERIMENT STATION AMES*
**SOUND ABSORPTION IN BINARY MIXTURES OF HALOMETHANE GASES,**
by M. L. Wang, R. R. Boade, and Sam Legvold. 6 Aug 64, 4p. Contract AF-AFOSR-62-319,
AFOSR 65-2828

Unclassified report

*Availability: Published in The Journal of Chemical Physics, v41 n12 p3879-80 Dec 15 1964. Copies to DDC users only.*

Descriptors: (*Halogenated hydrocarbons, Acoustic properties), (*Ultrasonic radiation, Absorption), Chlorine compounds, Fluorine compounds, Methane, Gases, Mixtures, Relaxation time

Results of sound absorption measurements on binary mixtures of CH2F2, CHF3, CF4 and CCl2F2 are given. The mixtures shown no evidence of multiple dispersion. The observed relaxation times are discussed in relation to a theory of Calvert and Amme. (Author)

**AD-628 427 Fld. 7/4, 20/6**
*ARKANSAS UNIV FAYETTEVILLE DEPT OF PHYSICS*
**EXCITATION OF THE 2P LEVEL IN LITHIUM BY ELECTRON IMPACT,**
by R. H. Hughes, and C. G. Hendrickson. 25 Aug 64, 1p. Contract AF-AFOSR-62-159,
AFOSR 65-2880

Unclassified report

*Availability: Published in Journal of the Optical Society of America, v54 n12 p1494 Dec 1964. Copies to DDC users only.*

Descriptors: (*Lithium, Excitation), (*Atomic energy levels, Lithium), Electron bombardment, Electron transitions, Probability, Molecular beams, Electron beams

The excitation function for the 2p to 2s (wavelength = 6708 A) line in the first spectrum of lithium was obtained by observing this radiation from the interaction region formed by a lithium-atom beam and a crossed electron beam. (Author)

**AD-628 447 Fld. 7/4**
*TEXAS UNIV AUSTIN DEPT OF PHYSICS*
**TEMPERATURE DEPENDENCE OF THE RATE OF CONVERSION OF HE (+) INTO HE2 (+),**

by Franklin E. Niles, and W. W. Robertson. 14 Oct 64. 5p. Contract AF-AFOSR-273-64, AFOSR 65-2506

Unclassified report

*Availability: Published in The Journal of Chemical Physics, v42 n9 p3277-80 May 1 1965. Copies to DDC users only.*

Descriptors: (*Reaction kinetics, Helium), Atoms, Molecules, Temperature, Glow discharges, Recombination reactions

Measurement of the decay of atomic and molecular emissions in the early helium afterglow for temperatures from 77 to 449K and pressures from 3.76 to 9.93 Torr, together with the known value for the ambipolar diffusion of He (+), have shown that the temperature dependence of the conversion frequency for the reaction He (+)+2He yields He2 (+)+He goes as 1/T. When the conversion frequency is expressed as beta rho-sq, the quantity beta tau-cubed is independent of temperature and pressure with an average value of 2.97x10 to the 9th power K-cubed/sec 2/Torr. Theoretical considerations confirm that the temperature dependence of the conversion frequency goes as 1/T. (Author)

**AD-628 448 Fld. 7/4**
*TEXAS UNIV AUSTIN DEPT OF PHYSICS*
**COLLISIONAL-RADIATIVE RECOMBINATION OF HE2 (+) INTO DISSOCIATIVE STATES,**
by W. W. Robertson. 18 May 64. 8p. Contract AF-AFOSR-273-64, AFOSR 65-2507

Unclassified report

*Availability: Published in The Journal of Chemical Physics, v42 n6 p2064-70 Mar 15 1965. Copies to DDC users only.*

Descriptors: (*Reaction kinetics, Helium), (*Recombination reactions, Reaction kinetics), Dissociation, Glow discharges, Molecular energy levels, Electron transistions

Spectroscopic investigation of a flowing helium afterglow revealed the presence of strong 10,830-A atomic helium emission corresponding to the 2 (3)P to 2 (3)S transition, which could be quenched by the application of a weak microwave field to the afterglow. An examination of the axial variation and pressure dependence of the concentration of 2 (3)P atoms established that it resulted primarily from the ion-electron recombination of He2 (+), rather than He (+), at the higher pressures examined. An extension of the theory of collisionalradiative recombination of molecular ions to include dissociating states is postulated to explain these observations. (Author)

**AD-628 465 Fld. 7/4**
*HARVARD UNIV CAMBRIDGE MASS*
**HYPERFINE SEPARATION OF DEUTERIUM,**
by S. B. Crampton, H. G. Robinson, D. Kleppner, and N. F. Ramsey. 15 Jul 65. 12p.

Unclassified report

Supported by NSF and ONR.

*Availability: Published in The Physical Review v141 n1 p55-66 Jan 1966. Copies to DDC users only.*

Descriptors: (*Deuterium, Hyperfine structure), (*Hyperfine structure, Deuterium), Hydrogen, Masers, Oscillation, Resonance, Electron transitions, Spectrum analyzers, Nuclear spins

The hyperfine separation of deuterium was measured by a spin-exchange technique in which deuterium interacts with radiating hydrogen in a hydrogen maser. Resonance of the deuterium is detected by its effect on the hydrogen oscillation power level. The result is 327 384 352.3 plus or minus 0.25 cps in the A1 time scale. A theoretical analysis of the technique and experimental details are presented. (Author)

**AD-628 480 Fld. 7/4**
*WISCONSIN UNIV MADISON THEORETICAL CHEMISTRY INST*
**DETERMINATION AND ASSESSMENT OF MORSE POTENTIAL FUNCTIONS FOR SOME NONPOLAR GASES.**
Revised ed.,
by Daniel D. Konowalow, and Sergio Carra. 27 May 65. 6p. Contract AF 33 (657)-7311 ,NSG-275-62

Unclassified report

Revision of manuscript received 14 Jan 65.

*Availability: Published in Physics of Fluids, v8 n9 p1585-9 Sep 1965. Copies to DDC users only.*

Descriptors: (*Gases, Molecular association), (*Molecular association, Potential theory), (*Potential theory, Gases), Argon, Kryaton, Xenon, Nitrogen, Methane, Viscosity

Morse potential functions for Ar, Kr, Xe, N2, and CH4 were determined from the experimental viscosity, eta (T), and second virial coefficient, B (T). These potentials afford only conditionally compatible (and not very accurate) descriptions of these two properties, although they compare favorably with high-energy repulsive potentials. In these respects, they are superior to those based largely on crystal data. The Morse and the Kihara sphericalcore potentials for Ar are compared. Neither is able to reproduce the known B (T), eta (T) as well as the repulsive potentials within acceptable limits. (Author)

**AD-628 481 Fld. 7/4, 20/10**
*WISCONSIN UNIV MADISON THEORETICAL CHEMISTRY INST*
**DIRECT CALCULATION OF CONTRIBUTIONS TO THE SECOND-ORDER ENERGY OF HELIUM,**
by Bowen Liu, William J. Meath, and Joseph O. Hirschfelder. 29 Jun 65. 3p. Contract NsG-275-62,

Unclassified report

*Availability: Published in The Journal of Chemical Physics, v43 n10 p3756-8 Nov 15 1965. Copies to DDC users only.*

Descriptors: (*Excitation, Helium), (*Helium, Atomic energy levels), Wave functions, Quantum mechanics, Perturbation theory, Hartree-Fock approximation

The first-order perturbed wavefunction of helium is written as a sum of terms due to various electron excitations. The portion of the first-order wavefunction due to one-electron excitations has been determined by several investigators. The portion due to two-electron excitations with one of the electrons excited to the 2s orbital is determined exactly by solving a differential equation. The contributions of these functions to the second-order energy are computed and found to be in exact agreement with the energies determined by direct summation of the spectral expansion. (Author)

**AD-628 482 Fld. 7/4, 20/10**
*WISCONSIN UNIV MADISON THEORETICAL CHEMISTRY INST*
**APPROXIMATION OF EXPECTATION VALUES,**
by Joseph O. Hirschfelder, and William A. Sanders. 13 Apr 65. 2p. Contract NSG-275-62, NSG-512

Unclassified report

*Availability: Published in The Journal of Chemical Physics, v43 n10 pS204-5 Nov 15 1965. Copies to DDC users only.*

Descriptors: (*Wave functions, Quantum mechanics), (*Approximation (Mathematics), Wave functions), Operators (Mathematics), Perturbation theory

The general problem of calculating expectation values for properties other than energy by the use of perturbation theory is considered. (Author)

**AD-628 483 Fld. 7/4**
*WISCONSIN UNIV MADISON THEORETICAL CHEMISTRY INST*
**DETERMINATION OF INTERMOLECULAR FORCES,**
by Joseph O. Hirschfelder. 13 Apr 65. 3p. Contract NsG-275-62,

Unclassified report

Prepared in Cooperation with Florida Univ., Gainesville. Grant NsG-512.

*Availability: Published in The Journal of Chemical Physics, v43 n10 pS199-S201 Nov 15 1965. Copies to DDC users only.*

Descriptors: (*Molecular association, Analysis), (*Potential theory, Molecular association), Kinetic theory, Electrostatics, Relativity theory

Some of the basic problems associated with the determination of intermolecular forces are considered. (Author)

**AD-628 523 Fld. 7/4, 20/3, 7/2**
**CFSTI Prices: HC $1.60 MF $0.50**
*SYRACUSE UNIV N Y DEPT OF CHEMISTRY*
**STRUCTURE AND MAGNETIC PROPERTIES OF TRANSITION AND LANTHANIDE METAL COMPOUNDS; UNUSUAL OXIDATION STATES.**
Final rept., 1962-1965,
by W. A. Baker Jr.. Oct 65. 8p. Rept. no. 1933, Contract AF-AFOSR-62-213, Proj. AF-9762, Task AF-37621, AFOSR 65-1920

Unclassified report

Descriptors: (*Transition elements, Magnetic properties), (*Rare earth compounds, Magnetic properties), (*Neodium compounds, Magnetic properties), Valence, Molecular structure, Halides, Synthesis (Chemistry), Balances, Low -temperature research, Oxides

Magnetic data for Nd2O3, NdX3 (X = F (-), Cl (-), Br (-), I (-)) indicate Curie-Weiss behavior. A magnetic balance for low temperature work is described. (Author)

**AD-628 550 Fld. 7/4**
**CFSTI Prices: HC $2.60 MF $0.50**
*NEW YORK UNIV N Y DEPT OF PHYSICS*
**METASTABLE TRIPLET-P2 RARE GAS POLARIZABILITIES,**
by Edward J. Robinson, Judah Levine, and Benjamin Bederson. 18 Jan 66. 27p. Contract Nonr-285 (60) ,DA-ARO (D)-31-124-G530

Unclassified report

Descriptors: (*Helium group gases, Polarization), (*Neon, Polarization), (*Krypton, Polarization), (*Xenon, Polarization), Atomic beams, Tensor analysis, Atomic energy levels, Atomic orbitals, Electron transitions

The atomic beam E-H gradient balance method was used to measure the zz components (alpha sub zz) (M sub J) of the (diagonalized) polarizability tensors in metastable triplet-P2 neon, krypton, and xenon, in their M sub J=+1 and +2 magnetic substates. These data are sufficient to determine the polarizability tensors in all the substates, as well as the spherically averaged polarizabilities (alpha). The gross structure of each of the metastable rare gases is similar to that of the ground state of the corresponding alkali, and it is found that the average polarizabilities are comparable. (Author)

**AD-628 571 Fld. 7/4, 7/3, 7/5**
**CFSTI Prices: HC $3.60 MF $0.50**
*SHEFFIELD UNIV (ENGLAND) DEPT OF CHEMISTRY*
**KINETICS OF THE TRIPLET STATE.**
Final scientific rept.,
by G. Porter, and J. W. Helpern. 30 Sep 65, 35p.
Contract AF 61 (052)-848,
AFCRL 66-12

Unclassified report

Descriptors: (*Luminescence, Quenching (Inhibition)), (*Naphtalene, Luminescence), (*Benzophenones, Atomic energy levels), (*Polycyclic compounds, Atomic energy levels), (*Atomic energy levels, Reaction kinetics), Iodine, Viscosity, Band spectrum, Electron transitions, Selection rules, Intensity, Photochemistry, Absorption spectrum, Great Britain

The quenching efficiency of iodine on triplet naphthalene was examined over a large range of viscosities and a previous observation that it is very efficient was confirmed. The decay of triplet benzophenone was studied and is normal at high viscosities, at low viscosities the ketyl radical is mainly observed. A new triplet band of naphthalene was identified. The intensity of the symmetry forbidden B-1g electronic band of biphenylene was calculated. A value a sixth of that observed for the 358 millimicron band is obtained suggesting that is possibly part of the B-1g band. (Author)

**AD-628 572 Fld. 7/4, 20/1**
*MISSISSIPPI UNIV UNIVERSITY*
**VIBRATIONAL RELAXATION IN CARBON DIOXIDE/WATER-VAPOR MIXTURES.**
Technical rept.,
by James W. L. Lewis, and K. P. Lee. 1965, 5p.
Contract Nonr-3078 (01), Proj. NR-384-307,

Unclassified report

*Availability: Published in Journal of Acoustical Society of America, v38 n5 p813-6 Nov 1965. Copies to DDC users only.*

Descriptors: (*Carbon dioxide, Relaxation time), (*Water vapor, Relaxation time), (*Sound, Absorption), Vapors, Acoustic properties, Velocity, Chemical bonds, Vibration, Mixtures

Sound-absorption and -velocity measurements in carbon dioxide water-vapor mixtures were made over the temperature range 23-195C. The measurements were made using plane progressive waves inside a glass tube 1.73 cm in diameter. Values of the mixture relaxation time obtained from the data increase from 0.27X10 to the -8th power sec at 23C to 0.58X10 to the -8th power sec at 195C, displaying no minimum value as has been reported previously by other authors. The collision efficiency decreases slightly over this temperature range. Values of an average collision diameter calculated from the experimental data are in good agreement with values predicted by the Widom-Bauer theory, the basis of which is a chemical affinity between the CO2 and H2O molecules. (Author)

**AD-628 585 Fld. 7/4, 7/5**
*GENERAL PRECISION INC LITTLE FALLS N J AEROSPACE RESEARCH CENTER*
**SELECTIVE ENHANCEMENT OF FLUORESCENCE FROM SOME RARE-EARTH SALTS IN SOLUTION,**
by Raymond P. Borkowski, Harvey Forest, and Daniel Grafstein. 5 Oct 64, 2p.

Unclassified report

*Availability: Published in The Journal of Chemical Physics, v42 n8 p2974-5 Apr 15 1965. Copies to DDC users only.*

Descriptors: (*Fluorescence, Intensity), (*Rare earth compounds, Fluorescence), (*Europium compounds, Fluorescence), Chlorides, Hydrates, Solutions, Solvents, Water, Heavy water, Band spectrum, Electron transitions, Salts

A report is given of the results of an examination of the fluorescence at equal concentration (0.25M) of solutions of EuCl3.6H2O in H2O and D2O carried out in order to determine the effects of deuteration on the intensity and lifetime of the emission bands. In water, three emission bands were observed from EuCl3.6H2O at 614, 588, and 555 millimicrons. The same three bands were also observed in D2O, but the emission band was about 11 times greater then in H2O for the 614 and 558 bands, while the 555 millimicron band showed far less enhancement.

**AD-628 642 Fld. 7/4**
*OKLAHOMA UNIV RESEARCH INST NORMAN*
**LINEWIDTHS OF THE MICROWAVE INVERSION SPECTRUM OF AMMONIA.**
Technical rept.,
by Robert L. Legan, James A. Roberts, Edgar A. Rinehart, and Chun C. Lin. 11 Aug 65, 10p.
Rept. no. TR-17,
Contract Nonr-982 (07) Proj. NR-014-109,

Unclassified report

*Availability: Published in The Journal of Chemical Physics, v43 n12 p4337-45 Dec 15 1965. Copies to DDC users only.*

Descriptors: (*Ammonia, Microwave spectroscopy), (*Microwave spectroscopy, Ammonia), Line spectrum, Impurities, Halogenated hydrocarbons, Chlorine compounds, Carbon dioxide, Kinetic theory

The linewidths of some 25 inversion spectral lines of ammonia in the frequency region of 18-29 kMc/sec were measured. Corrections due to various effects such as source modulation, cell-length broadening, and Doppler shift were applied to the experimental data to evaluate the linewidth parameters. Self-broadening and foreigngas broadening by some 15 different gases were studied. In the case of self-broadening of the series of lines with J = K for which the effect of rotational resonance is negligible, the width parameters determined experimentally agree well with those calculated by Anderson's theory from (2, 2) to (5, 5) but appreciable deviations are found at higher J. For the lines with J not = K, the discrepancy becomes larger and increases with increasing difference between J and K. The quantum number dependence of the foreign-gas broadening by methyl chloride and by carbon dioxide was investigated in detail. For methyl chloride broadening the theoretical and measured widths agree with each other to about the same extent as in self-broadening, whereas the agreement is somewhat less satisfactory in the case of carbon dioxide. An alternative formulation of the collision theory of line broadening is presented. Here the theory of radiation interruption is treated as a problem of multichannel collision. (Author)

**AD-628 656 Fld. 7/4, 20/8**
*QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS*
**THE CROSS SECTIONS FOR IONIZATION OF THE EXCITED STATES OF ATOMIC HYDROGEN BY HIGH ENERGY ELECTRONS,**
by A. E. Kingston. 28 Jul 65, 4p. Contract N62558-4297,

Unclassified report

*Availability: Published in Proceedings of the Physical Society, v86 p1279-81 1965. Copies to DDC users only.*

Descriptors: (*Electron bombardment, Hydrogen), (*Ionization, Probability), Excitation, Atomic energy levels, Ground state

At large incident electron energies E the cross sections for ionization of the excited states of hydrogen may be written as A (log E)/E. We use the Bethe approximation to calculate the A's for all of the degenerate levels of the first five states of hydrogen. The calculations suggest that for the average ionization cross section of these states the A's are proportional to the -1/2 power of the ionization potential of the state. (Author)

**AD-628 658 Fld. 7/4, 4/1, 20/9**
*PITTSBURGH UNIV PA DEPT OF PHYSICS*
**DISSOCIATIVE RECOMBINATION IN NEON: SPECTRAL LINE-SHAPE STUDIES.**
Technical rept.,
by T. Robert Connor, and Manfred O. Biondi. 1 Jun 65, 15p. Rept. no. TR-4,
Contract Nonr-624 (13) Proj. NR-012-114,

Unclassified report

*Availability: Published in The Physical Review, v140 n3A pA778-91 Nov 1 1965. Copies to DDC users only.*

Descriptors: (*Neon, Recombination reactions), (*Line spectrum, Neon), Dissociation, Ionosphere, Interferometers, Spectroscopy, Microwave spectroscopy, Plasma medium, Kinetic energy, Excitation, Glow discharges, Gas ionization

Optical interferometric, spectrographic, and microwave techniques were used to investigate the nature of electronion recombination in neon afterglows. Electron-density decay measurements yield a two-body recombination coefficient of approx. 0.0000002 cc/sec. in agreement with earlier studies carried out at electron densities an order of magnitude smaller. The hypothesis that dissociative recombination, Ne2 (+)+e (reversibly yields) (Ne2*) (unstable) Ne* + Ne + kinetic energy is the process operative is tested by seeking to detect the kinetic energy of dissociation in the excited atoms produced by recombination. Fabry-Perot interferometer studies of the width of the 5852 wavelength (2p1-1s2) neon line indicate that in the afterglow the line is very much broader than the thermal (300K) atom width observed in the discharge. This excess width in the afterglow line is found to decrease with increasing neon gas pressure, owing to increased likelihood of excitation transfer from the fast atoms to thermal atoms before radiation. Higherresolution studies of the spectra-line profiles indicate that the afterflow line consists of a 'broad-shouldered,' flat-topped component of the form expected for radiation from dissociatively produced excited atoms, surmounted by a narrow, thermal core resulting from radiation from slow-excited atoms produced by excitation transfer. (Author)

**AD-628 660 Fld. 7/4**
*INSTITUTE FOR MOLECULAR PHYSICS UNIV OF MARYLAND COLLEGE PARK*
**VALIDITY OF THE JARMAIN-SANDEMAN SERIES FOR CALCULATING POTENTIAL CURVES OF DIATOMIC MOLECULES,**
by R. H. Davies, and Joseph T. Vanderslice. 22 Jul 65, 11p. Contract DA-ARO (D)-31-124-G466 ,NSG-398
AROD 4251:8

Unclassified report

*Availability: Published in Canadian Journal of Physics, v44 p219-28 1966. Copies to DDC users only.*

Descriptors: (*Diatomic molecules, Molecular energy levels), (*Molecular energy levels, Diatomic molecules), Potential theory, Band spectrum, Nitrogen, Hydrogen, Dissociation

The Jarmain-Sandeman series for the determination of potential curves for diatomic molecules is shown to be absolutely convergent for energies up to the dissociation limit. The rapidity of conver-

gence is also tested, and it is concluded that the series should be reliable for most cases of interest. (Author)

**AD-628 720 Fld. 7/4**
*TECHNION ISRAEL INST OF TECH HAIFA DEPT OF CHEMISTRY*
**SCHUMANN-RUNGE BANDS OF O2 IN SOLID PHASES: SPECTROSCOPIC MEASUREMENT OF INTERMOLECULAR POTENTIALS,**
by O. Schnepp, and K. Dressler. 30 Nov 64, 9p. Contract AF 61 (052)-428, Proj. AF-9763, Task 976302.
AFOSR 65-2547
Unclassified report

Prepared in cooperation with Princeton Univ., N. J. and National Bureau of Standards, Washington, D. C.

*Availability: Published in Journal of Chemical Physics, v42 n7 p2482-9 Apr 1 1965. Copies to DDC users only.*

Descriptors: (*Solidified gases, Band spectrum), (*Oxygen, Band spectrum), (*Molecular association, Solidified gases), Nitrogen, Argon, Absorption spectrum, Chemical bonds, Vibration, Atomic energy levels, Excitation, Electrostatics, Potential theory, Israel

The absorption spectra of oxygen in solid solution in nitrogen and argon were investigated in the spectral region of the Schumann-Runge bands. Eleven discrete bands were measured in each case. The vibrational structure is very similar to that of the free molecule for low vibrational quantum numbers of the excited electronic state but the spacings deviate considerably from those of the gas for higher quantum numbers, inasmuch as their convergence is slower. Potential curves were constructed from the data for the oxygen molecule perturbed by the solid solvent cage. The deviations of these curves from those of the free molecule were analyzed in terms of oxygen-argon and oxygen-nitrogen pair repulsive potentials. (Author)

**AD-628 722 Fld. 7/4, 7/3**
*GATES AND CRELLIN LABS OF CHEMISTRY CALIF INST OF TECH PASADENA*
**EXCITON STRUCTURE IN TWO TRIPLET STATES OF CRYSTALLINE NAPHTHALENE,**
by David M. Hanson, and G. Wilse Robinson. 24 Sep 65, 2p. Contract DA-31-124-ARO (D)-251, AROD 3447:1C
Unclassified report

*Availability: Published in The Journal of Chemical Physics v43 n11 p4174-5 Dec 1 1965. Copies to DDC users only.*

Descriptors: (*Naphthalenes, Molecular energy levels), (*Molecular energy levels, Naphthalenes), Crystals, Electron transitions, Quantum mechanics

The communication reports preliminary work on pure crystalline naphthalene (C10H8) and is intended to illustrate the importance of excitation exchange interactions even when no strong transition dipoles are present. In addition, the position of a new triplet state of naphthalene is reported.

**AD-628 746 Fld. 7/4, 7/2**
**CFSTI Prices: HC $4.60 MF $0.50**
*LITTLE (ARTHUR D) INC CAMBRIDGE MASS*
**THE MECHANISM OF PROTON TRANSPORT IN AQUEOUS SOLUTIONS.**
Technical rept.,
by R. A. Horne. 1 Mar 66, 49p. Rept. no. TR-20,
Contract Nonr-4424 (00), Proj. NR-051-460,
Unclassified report

Descriptors: (*Hydrogen, Chemical reactions), (*Protons, Chemical reactions), (*Molecular association, Water), (*Water, Molecular association), Solutions, Transport properties, Thermochemistry, Reaction kinetics, Electrical conductance, Electrophoresis, Ions

The Grotthuss mechanism, which is responsible for the majority of proton transport in aqueous solutions, occurs in sporatic multistep spurts along transitory chains in the rotatable, 'free' or monomeric water between the structured clusters in liquid water. Arguments are presented in support of the view that the rotating species in the rate-determining step of this process is H3O (+) rather than H2O (or H9O4 (+)). If such is the case, then the usual electrophoretic and relaxation effects should be absent in protonic transport. (Author)

**AD-628 750 Fld. 7/4, 7/2**
**CFSTI Prices: HC $3.60 MF $0.50**
*WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)*
**INFRARED SPECTRA OF HCl IN PURE AND IMPURE NOBLE GAS MATRICES. ABSOLUTE INTENSITIES.**
Technical scientific note,
by J. M. P. J. Verstegen, Hanna Goldring, S. Kimel, and B. Katz. Oct 65, 31p. Rept. no. TN-3,
Contract AF 61 (052)-838,
AFCRL 66-37
Unclassified report

Prepared in cooperation with Technion - Israel Inst. of Tech., Haifa. Dept. of Chemistry.

Descriptors: (*Hydrochloric acid, Spectra (Infrared)), (*Infrared spectroscopy, Hydrochloric acid), (*Helium group gases, Infrared spectroscopy), (*Solidified gases, Impurities), Absorption spectrum, Intensity, Argon, Keypton, Xenon, Line spectrum, Crystal lattices, Electron transitions, Polymers, Israel

High-resolution spectra were taken of the 1-O absorption band of HCl trapped in argon, krypton, and xenon matrices in the temperature range between 6K and 50K. The influence of impurities on such spectra was studied by introducing small quantities of a different noble gas into the matrices. A new spectral line, believed to be due to the combination of a delta-J = O transition with a lattice mode is reported. Absolute intensities of the 1-O band were measured and found to be 15000, 18500, and 18000 darks in argon, krypton, and xenon respectively. The spectra of HCl polymers are discussed. (Author)

**AD-628 779 Fld. 7/4**
**CFSTI Prices: HC $1.60 MF $0.50**
*WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)*
**NEW DETERMINATION OF THE STRENGTH OF THE V3 BAND OF WATER VAPOR FORM DISPERSION MEASUREMENTS.**
Scientific rept.,
by M. A. Hirshfeld, J. H. Jaffe, and G. Ross. 28 Nov 65, 13p. Rept. no. Scientific-4,
Contract AF 61 (052)-838,
AFCRL 66-38
Unclassified report

Descriptors: (*Water vapor, Band spectrum), (*Band spectrum, Water vapor), Spectroscopy

The strength of the v sub 3 band of water vapor has been redetermined, using the same method as that of Jaffe and Benedict-the measurement of the dispersion of a single line of the band. Improved instrumentation has yielded more accuracy. The final value is S sub v = 172 plus or minus 7/sq cm/atm at 300K. (Author)

**AD-628 818 Fld. 7/4**
**CFSTI Prices: HC $1.60 MF $0.50**
*BASEL UNIV (SWITZERLAND) INST OF PHYSICS*
**ANALYSIS OF THE SPECTRUM OF THE NITRIC OXIDE MOLECULE.**
Annual scientific rept. no. 2,
by E. Miescher. 2 Oct 65, 15p. Contract AF-EOAR-109-63,
AFCRL 66-35
Unclassified report

See also AD-600 389.

Descriptors: (*Nitrogen compounds, Oxides), (*Oxides, Nitrogen compounds), (*Absorption spectrum, Analysis), Switzerland, Molecular spectroscopy, Isotopes

The absorption spectrum of 4 isotopically different NO molecules is photographed with high resolving power down beyond 1300A. New Rydberg states ns, np, nd, nf...are reported. The assignment of observed non-Rydberg levels to predicted states is discussed. (Author)

**AD-628 830 Fld. 7/4, 20/1**
*IOWA ENGINEERING EXPERIMENT STATION AMES*
**SOUND ABSORPTION IN SUBSTITUTED METHANE -INERT-GAS MIXTURES,**
by E. B. Miller, R. R. Boade, and Sam Legvold. 6 Aug 64, 4p. Contract AF-AFOSR-62-319,
AFOSR 65-2862
Unclassified report

*Availability: Published in Journal of Chemical Physics v42 n8 p2982-3 Apr 15 1965. Copies to DDC users only.*

Descriptors: (*Halogenated hydrocarbons, Acoustic properties), (*Helium group gases, Acoustic properties), (*Sound, Absorption), Methane, Fluorine compounds, Chlorine compounds, Relaxation time, Velocity, Mixtures, Argon, Neon, Helium

Velocity dispersion in the substituted methane gases: CF4, CHF3, and CCl2F2; with the noble gases: Ar, Ne, and He; was previously reported by Olson and Legvold. The velocity measurements were made with a Pierce-type acoustic interferometer in conjunction with a Brown chart recorder, which provided a plot of oscillator plate current versus the separation between the sound source and the reflector. The work now reported is a result of re-examining these charts in order to determine the frequency dependence of the acoustic absorption coefficient and thus to obtain relaxation data in an alternative manner. (Author)

**AD-628 835 Fld. 7/4**
**CFSTI Prices: HC $1.10 MF $0.50**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**RESONANCE ENERGY AND IONIC ATTRACTION IN HETEROMOLECULES,**
Scientific rept.,
by Rolf Manne. 1 Jul 65, 9p. Rept. no. Scientific-48,
Contract AF 61 (052)-701, Proj. AF-7112, ARL 66-0035
Unclassified report

Descriptors: (*Chemical bonds, Electrostatics), (*Molecular orbitals, Chemical bonds), Resonance, Energy, Ions, Molecular association, Diatomic molecules, Sweden

The postulate that the valence bond resonance stabilization energy of a heteromolecule is due to Coulomb attraction between the partially ionized atoms is examined with the help of simple molecular orbital theory. Although both quantities are quadratic in the electronegativity difference the equating of the constants of proportionality cannot readily be given a theoretical justification. (Author)

**AD-628 862 Fld. 7/4, 7/3**
*OKLAHOMA UNIV RESEARCH INST NORMAN*
**MICROWAVE SPECTRUM AND INTERNAL ROTATION OF METHYLTHIOCYANATE.**
Technical rept.,
by S. Nakagawa, S. Takahashi, T. Kojima, and Chun C. Lin. 26 Jul 65, 5p. Rept. no. TR-16, Contract Nonr-982 (07), Proj. NR-014-109,
Unclassified report

Supported in part by NSF.

*Availability: Published in The Journal of Chemical Physics v43 n10 p3583-6 15 Nov 1965. Copies to DDC users only.*

Descriptors: (*Thiocyanates, Molecular rotation), (*Molecular rotation, Thiocyanates), (*Molecular spectroscopy, Thiocyanates), Microwave spectroscopy, Dipole moments, Excitation, Molecular structure, Chemical bonds, Stark effect

The microwave spectrum of methylthiocyanate was investigated in the frequency range of 8-34 kMc/sec. The rotational constants determined from the spectrum are A=15 796.2, B=4155.4, and C=3354.2 Mc/sec. From the Stark effect of the low-J lines, the dipole moment is found to be very nearly parallel to the principal a axis with a magnitude of 4.03 D. Splittings due to internal rotation (A-E splittings) are observed for rotational transitions in the ground and in the first excited torsional states. Analysis of these splittings gives an internal barrier of 556/cm. Two sets of vibrational satellite lines are found for all the low-J transitions. They are believed to be associated with the first two excited states of a bending vibrational mode of frequency about 160/cm. A structure of the molecule which is consistent with the rotational constants is C-H=1.093 A, (angle HCH= 109 degrees 28 min.), C-S (CH3-S)=1.820 A, C-N=1.156 A, S-C=1.684 A, and (angle CSC=99 degrees 52 min.). (Author)

**AD-628 051 See Fld. 20/12**

**AD-628 071 See Fld. 10/2**

**AD-628 075 See Fld. 20/3**

**AD-628 091 See Fld. 12/1**

**AD-628 118 See Fld. 7/2**

**AD-628 144 See Fld. 21/2**

**AD-628 171 See Fld. 10/2**

**AD-628 250 See Fld. 7/2**

**AD-628 276 See Fld. 11/2**

**AD-628 282 See Fld. 11/2**

**AD-628 283 See Fld. 6/1**

**AD-628 306 See Fld. 21/2**

**AD-628 346 See Fld. 20/12**

**AD-628 363 See Fld. 20/12**

**AD-628 419 See Fld. 6/8**

**AD-628 464 See Fld. 20/9**

**AD-628 496 See Fld. 9/2**

**AD-628 515 See Fld. 11/2**

**AD-628 529 See Fld. 10/1**

**AD-628 617 See Fld. 20/4**

**AD-628 622 See Fld. 7/3**

**AD-628 625 See Fld. 12/2**

**AD-628 629 See Fld. 20/4**

**AD-628 652 See Fld. 7/3**

**AD-628 657 See Fld. 20/6**

**AD-628 744 See Fld. 7/5**

**AD-628 745 See Fld. 20/6**

**AD-628 793 See Fld. 20/12**

**AD-628 834 See Fld. 20/10**

**AD-628 879 See Fld. 20/8**

**AD-628 880 See Fld. 20/8**

**AD-628 881 See Fld. 20/8**

## 7/5. RADIO AND RADIATION CHEMISTRY

**AD-628 086 Fld. 7/5, 7/3**
*CALIFORNIA UNIV DAVIS DEPT OF CHEMISTRY*
**THE PHOTOCHEMICAL REACTION OF HYDROGEN PEROXIDE WITH ALLYL ALCOHOL-3,3-D2,**
by L. J. Leyshon, and D. H. Volman. 22 Jul 65, 5p. Contract DA-ARO (D)-31-124-G529 ,PHS-CA-05528
AROD 3861:3
Unclassified report

*Availability: Published in Journal of the American Chemical Society, v87 n24 p5565-8 Dec 20 1965. Copies to DDC users only.*

Descriptors: (*Hydrogen peroxide, Photochemistry), (*Alcohols, Photochemistry), (*Photochemistry, Alcohols), Photolysis, Free radicals, Deuterated compounds, Chemical analysis, Electron spin resonance, Ultraviolet radiation, Chromatographic analysis

The reaction of hydroxyl radicals, derived from the photolysis of hydrogen peroxide, with allyl alcohol3,3-d2 in the frozen state at 77K, and in liquid solutions in the range 253-350K, was studied. An analytical method based on the gas phase reaction of water with sodium mirrors was developed. For the reaction with sodium, the isotopic separation factor for protium and deuterium in water was found to be 1.8 in the range of 0-35% deuterium. For all the photochemical experiments, abstraction of deuterium atoms was shown to occur with 8.4 = 2.5% of the hydroxyl radicals formed; the remainder was considered to add to the olefinic bond. Electron spin resonance spectra of irradiated frozen samples showed that absorption of light by the deuterated allyl alcohol leads to cleavage of the carbon-oxygen bond and that the reaction of hydroxyl radicals with the alcohol is consistent with the interpretation that deuterium atoms are abstracted. (Author)

**AD-628 301 Fld. 7/5, 11/9**
**CFSTI Prices: HC $1.60 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**INVESTIGATION OF THE ROLE OF FREE RADICALS IN THE ACETALDEHYDE POLYMERIZATION PROCESS IN THE SOLID PHASE UNDER GAMMA-IRRADIATION,**
by V. S. Pshezetskii, and V. I. Tupikov. 5 Nov 65, 16p. Rept. no. FTD-TT-65-978, TT 66-60577
Unclassified report

Unedited rough draft trans. of unidentified mono. Geterotsepnye Vysokomolekulyarnye Soiedineniya, Sbornik Statei, n. p. 1963 p213-9.

Descriptors: (*Free radicals, Aldehydes), (*Aldehydes, Polymerization), (*Acetal plastics, Preparation), (*Radiation chemistry, Aldehydes), Recombination reactions, Gamma rays, Polymers, Decomposition, Ultraviolet radiation, Crystals, Paramagnetic resonance, USSR

The EPR method was used to investigate the processes of formation and recombinations of the radicals that form in crystalline acetaldehyde under gamma-irradiation. It was established that in the dose range from 0.1 to 10 Mrad, the radical concentration corresponds in order of magnitude to the concentration of polymer chains. Radical recombination takes place abruptly at temperatures coinciding with the 'critical' temperatures determined by the thermography method. It was found that monomolecular rapture takes place at small radiation doses; at larger doses (0.2 Mrad and up), chain rupture takes place in accordance with a bimolecular law. UV radiation initiates polymerization of crystalline acetaldehyde. The nature of the radicals that appear corresponds perfectly to that of the radicals formed on exposure to gamma-radiation: the concentration of the radicals corresponds to that of the molecular chains. The results obtained justify the assumption that polymerization of crystalline acetaldehyde proceeds by the radical mechanism when initiated by either ionizing radiation or ultraviolet light. (Author)

**AD-628 328 Fld. 7/5**
**CFSTI Prices: HC $1.10 MF $0.50**
*NORTHWESTERN UNIV EVANSTON ILL*
**MONOENERGETIC PHOTOLYTIC REACTIONS.**
Final rept., 1 Oct 61-1 Oct 65,
by E. W. Schlag. 1 Oct 65, 10p. Contract AF-AFOSR-524-64,AF-AFOSR-62-83 Proj. AF-9760, Task 976002,
AFOSR 66-0153
Unclassified report

Descriptors: (*Photolysis, Energy), (*Ketones, Photolysis), (*Cyclopropanes, Molecular energy levels), (*Ultraviolet radiation, Photochemistry), (*Ionization, Ultraviolet radiation), Monocyclic compounds, Excitation, Theory, Ultraviolet equipment, Microwave equipment, Polyatomic molecules, Reaction kinetics, Photons

The photolysis of cyclobutanone was investigated. Some work on the mechanism confirmed that it was a simple photolytic decomposition. One of the directly formed products is cyclopropane. Since the light quantum excites cyclobutanone with about 112 kcal/mole, the initially formed cyclopropane will similarly be highly excited. In fact the energy of the cyclopropane can be varied continuously since the wavelength irradiating the cyclobutanone can be varied continuously. A vibrationally excited molecule is thus had whose decomposition can be studied as the excitation energy is varied. Such systems are needed as test cases in the theory of reaction rates. Much time was spent developing an adequate theory for these reactions. A new way of analysing rate equations was proposed, for molecular systems that undergo reactions from many quantum levels. Some work in the vacuum ultraviolet region was also done. A high intensity light source was developed for use in this region, operated by microwaves at high power. With this source and a monochromator, thresholds for ionization of inorganic molecules were measured. Investigations relevant to the theory of absolute reaction rates were also performed. (Author)

**AD-628 724 Fld. 7/5, 20/8, 20/6**
*INSTITUTE OF OPTICS UNIV OF ROCHESTER N Y*
**MULTIPHOTON IONIZATION OF RARE GAS AND HYDROGEN ATOMS,**
by H. Barry Bebb, and Albert Gold. 1965, 10p. Contract DA-31-124-ARO (D)-306,
AROD 5314:2
Unclassified report

*Availability: Published in Physics of Quantum Electronics, p489-98. Copies to DDC users only.*

Descriptors: (*Gas ionization, Potential theory), (*Helium group gases, Gas ionization), (*Hydrogen, Gas ionization), (*Photons, Gas ionization), Xenon, Krypton, Argon, Neon, Helium, Lasers, Electron transitions, Probability, Reaction kinetics, Gas discharges

The cross sections for ionization of Xe, Kr, Ar, Ne, He, and H atoms by simultaneous absorption of 7, 8, 9, 13, 14, and 8 ruby laser photons were calculated from perturbation theory. The rare gases have previously been treated in only the crudest approximation. An extensive treatment of hydrogen was made as a test of these approximations. It is found that the cross section for dipolar transitions in the simplest approximation (plane-wave final state, simplest approximation to the matrix element) is about three orders of magnitude smaller than that for a fairly sophisticated treatment (Coulomb final states, good approximate matrix elements). The best value for H is sigma = 1.4 x 10 to the -244 power (flux) to the -7th power sq. cm. This result lowers the predicted 'initiation thresholds' for this process by a factor fo 3. Application of the improved model to rare gases indicates that direct multiphoton ionization can provide the starting electron for observed optical breakdown of gases but that other processes subsequently dominate. The effect of finite widths of states on the rates is also discussed. (Author)

**AD-628 744 Fld. 7/5, 7/4**
*WINDSOR UNIV (ONTARIO) DEPT OF PHYSICS*
**SENSITIZED FLUORESCENCE IN VAPORS OF ALKALI METALS. IV. ENERGY TRANSFER IN RUBIDIUM-RUBIDIUM COLLISIONS,**
by A. G. A. Rae, and L. Krause. 3 May 65, 18p. Contract AF-AFOSR-361-65, AFOSR 65-2861

Unclassified report

*Availability: Published in Canadian Journal of Physics, v43 p1574-88 Sep 1965. Copies to DDC users only.*

Descriptors: (*Alkali metals, Fluorescence), (*Fluorescence, Vapors), (*Rubidium, Fluorescence), Atomic energy levels, Resonance, Vapor pressure, Photons, Gas ionization, Canada

Sensitized fluorescence in rubidium vapor has been investigated in order to determine total cross sections for collisions of the second kind between rubidium atoms, leading to the transfer of excitation between the 5 (2)P-1/2 and 5 (2)P-3/2 resonance levels. The experiments were carried out at vapor pressures below 0.00001 mm Hg, where there is virtually no imprisonment of resonance radiation. The exceedingly low fluorescent intensities were registered in an automatically programmed sequence of measurements, using photon counting techniques. (Author)

**AD-628 526 See Fld. 20/5**

**AD-628 571 See Fld. 7/4**

**AD-628 585 See Fld. 7/4**

# Field 8-EARTH SCIENCES AND OCEANOGRAPHY

## 8/1. BIOLOGICAL OCEANOGRAPHY

**AD-628 195 Fld. 8/1, 8/10**
**CFSTI Prices: HC $2.60 MF $0.50**
*DEPARTMENT OF THE NAVY WASHINGTON D C*
**ORGANIC MATTER IN SEDIMENTS IN THE NORWEGIAN SEA AND CONDITIONS FOR THE ACCUMULATION OF SUCH MATTER,**
by T. I. Gorshkova. 1966, 29p. Rept. no. Translation-2089, TT 66-60558

Unclassified report

Organicheskoe Veschestvo v Osadkakh Norwezhskogo Morya i Usloviia Ego Nakopleniya, trans. of Vsesoyuznyi Nauchno-Issledovatelskii Institut Morskogo Rybnogo Khozvaistva i Okeanografii. Trudy (USSR) v46 p38-57 1962.

Descriptors: (*Norwegian Sea, Ocean bottom sampling), (*Oceanology, Norwegian Sea), Sedimentation, Organic materials, Marine biology

**AD-628 408 Fld. 8/1, 6/3**
*COMMUNICATION RESEARCH INST MIAMI FLA*
**ANIMALS IN AQUATIC ENVIRONMENTS: ADAPTATION OF MAMMALS TO THE OCEAN.**
Chapter 46,
by John C. Lilly. 1964, 7p. Contract AF-AFOSR-415-63, AFOSR 65-2945

Unclassified report

*Availability: Published in Handbook of PhysiologyEnvironment p741-7 1964. Copies to DDC users only.*

Descriptors: (*Cetacea, Adaptation (Physiology)), Marine biology, Body weight, Brain, Physiology, Respiration, Ingestion (Physiology), Nutrition, Sleep, Marine biological noise, Ultrasonic radiation, Echo ranging

Contents: Origin of cetaceans; Adaptation; Brain weights versus body length/body weight relationships; Tursiops truncatus, an experimental subject; Physiological functions; Respiration and ingestion; Nutrition; Natural versus unnatural existence; Sleep; Communication; Sonic and ultrasonic emissions; Language concepts.

**AD-628 589 Fld. 8/1, 6/3**
*COPENHAGEN UNIV HELSINGOER (DENMARK) MARINE BIOLOGICAL LAB*
**ON THE CILIATE FAUNA ASSOCIATED WITH THE MARINE SPECIES OF THE AMPHIPOD GENUS GAMMARUS J. G. FABRICIUS,**
by Tom Fenchel. 1965, 24p. Contract N62558-2905,

Unclassified report

*Availability: Published in Ophelia, v2 n2 p281-303 1965. Copies to DDC users only.*

Descriptors: (*Ciliata, Marine biology), (*Crustacea, Ciliata), Ecology, Distribution, Morphology (Biology), Sea water, Salinity, Parasites, Denmark

The paper describes the ciliate epifauna found on the marine species of the amphipod genus Gammarus in Scandinavian waters. Twentyfive species of ciliates were found which, ecologically, could be placed in the following four groups: Suspension feeders, herbivores, carnivores, and parasites. It is shown that the forming of swarmers in sessile commensals (peritrichs and chonotrichs) is correlated with the moulting of the host. While most of the epizoans found on Gammarus are specific for the genus, the distribution of the ciliates within the host genus is controlled mainly by environmental factors, especially salinity. The marine and brackish water Gammarus species have no ciliates in common with the fresh-water species G. lacustris. Even G. duebeni, when living in fresh-water, has an impoverished marine fauna of ciliates. Brackish water populations of Gammarus species were found to harbour the greatest number of ciliate species. This is in contrast to the general concept that a smaller number of species is found in brackish water than in similar localities in the sea and in fresh-water. This is explained by the fact that Gammarus forms much denser populations and has a much wider distribution in brackish water than in marine environments. (Author)

**AD-628 590 Fld. 8/1, 6/3**
*COPENHAGEN UNIV HELSINGOER (DENMARK) MARINE BIOLOGICAL LAB*
**LIFE HISTORY AND BIOLOGY OF KRONBORGIA AMPHIPODICOLA CHRISTENSEN AND KANNEWORFF (TURBELLARIA, NEORHABDOCOELA),**
by Aage Moeller Christensen, and Birgitte Kanneworff. 1965, 17p. Contract N62558-2905,

Unclassified report

*Availability: Published in Ophelia v2 n2 p237-51 Dec 1965. Copies to DDC users only.*

Descriptors: (*Marine biology, Parasites), (*Crustacea, Parasites), Life cycle, Adults, Larvae, Males, Females, Periodic variations, Reproduction (Physiology), Denmark

The life history of the turbellarian Kronborgia amphipodicola, an endoparasite of certain ampeliscid amphipods, is described and some aspects of its biology are mentioned and discussed. The parasite is annual and, when sexually mature, both sexes leave their host. The female starts immediately to construct its cocoon which is then entered by one or several dwarf males. Having been fertilized the female proceeds to fill the cocoon with egg capsules. Spawning is completed in about 4 days whereupon the female leaves the cocoon and dies. The larva, which hatches after 50-60 days, must find a host within about 48 hours if it is to survive. Having found one it attaches with its anterior end to the host's carapace and encysts itself. Less than 24 hours later it creeps into the host through a very small hole made in the carapace solely by chemical means, a method of entrance apparently not reported so far for any parasite living in crustacea. Many larvae may enter the same host specimen and as many as 31 males have been found in a single Ampelisca macrocephala whereas the corresponding figure for females was four. Both sexes may occur alone or together in the same host specimen. The sex ratio is skewed with 3 to 25 times as many males as females depending on the species making up the host population. The parasite sterilizes both sexes of the host and the female parasite, furthermore, elicits death of the host when leaving it. (Author)

**AD-628 591 Fld. 8/1, 6/3**
*COPENHAGEN UNIV HELSINGOER (DENMARK) MARINE BIOLOGICAL LAB*
**LIFE CYCLE, FOOD, AND GROWTH OF THE AMPHIPOD AMPELISCA MACROCEPHALA LILJEBORG FROM THE OERESUND,**
by Ebbe Kanneworff. 1965, 15p. Contract N62558-2905,

Unclassified report

*Availability: Published in Ophelia, v2 n2 p305-18 Dec 1965. Copies to DDC users only.*

Descriptors: (*Marine biology, Crustacea), (*Crustacea, Life cycle), Food, Growth, Males, Females, Reproduction (Physiology), Ingestion (Physiology), Periodic variations, Denmark

The lifespan of Ampelisca macrocephala was found to be one and a half year for males and two years for females. A few females become three years old and breed a second time. It is estimated that the length of the animal increases by about 10% at each molting and that approximately 18 molts take place before the egg-carrying stage is reached. Growth is fast in spring, slower in summer and autumn when the ovaries and tests develop in animals about to breed, and stagnating in winter when the females carry embryos. The latter stay in the marsupium for five months, during which time their length increases from about 0.8 to about 1.3 mm. The average egg number per female was found to be about 60. The feeding beha-

viour is described, and it was found that the animal will accept zoo-plankton as food in the laboratory. In the field, however, the intestinal contents of collected animals indicate that they feed on detritus. The periods of growth and reproduction seem to be closely correlated with the periods of primary and secondary production in the Oresund, whereas temperature was found unimportant as a governing factor. The Ampelisca population studied was heavily infested with the turbellarian endoparasite Kronborgia amphipodicola Christensen and Kanneworff, and studies on the influence of this parasite revealed that it affects growth and causes sterility in all infested host animals. (Author)

**AD-628 592 Fld. 8/1, 6/3**
*COPENHAGEN UNIV HELSINGOER (DENMARK) MARINE BIOLOGICAL LAB*
**FEEDING BIOLOGY OF THE SEA-STAR LUIDIA SARSI DUBEN AND KOREN,**
by Tom Fenchel. 1965, 17p. Contract N62558-2905,
Unclassified report

*Availability: Published in Ophelia, v2 n2 p223-36 Dec 1965. Copies to DDC users only.*

Descriptors: (*Marine biology, Echinodermata), (*Echinodermata, Ingestion (Physiology)), Life span, Life cycle, Larvae, Rhythm (Biology), Growth, Salinity, Denmark

A population of the sea-star Luidia sarsi Duben and Koren, which probably metamorphosed in the spring of 1963 and which was first found in the fall of 1963, was followed in the Oresund during a two-year period. The irregular appearance of Luidia sarsi in the Oresund is discussed and it is concluded that it is due to -1. That larval invasions do not occur every year, -2. That larvae of an already existing population in the Oresund will be killed in the brackish water of the Baltic Sea, -3. That low salinity may reduce or eradicate the populations especially in winters, and -4. That the life length probably does not exceed 4-5 years. The stomach contents of 42 specimens were examined; it was found that L. sarsi feeds exclusively on the brittlestars Ophiura albida and Amphiura filiformis and the sea-urchin Echinocardium cordatum, the first mentioned being by far the most important. These results were verified experimentally. Starved Luidia will also eat certain other species of brittlestars but at a reduced rate and it will not feed on any other uninjured bottom invertebrates (asterids, lamellibranchs, polychaetes). It will, however, accept pieces of meat of these animals. The feeding behavior is described. Luidia sarsi was found to be among the fastest moving asterids described. It was demonstrated that L. sarsi, at least in the laboratory, exhibits diurnal rhythmic activity which is controlled by light and that it seeks its food actively. (Author)

## 8/2. CARTOGRAPHY

**AD-628 612 Fld. 8/2, 9/2**
**CFSTI Prices: HC $3.60 MF $0.50**
*NORTHWESTERN UNIV EVANSTON ILL DEPT OF GEOGRAPHY*
**THREE COMPUTER PROGRAMS FOR CONTIGUITY MEASURES.**
Technical rept.,
by David Anderson. Dec 65, 40p. Rept. no. TR-5, Contract Nonr-1228 (33) Proj. NR-389-140,
Unclassified report

Descriptors: (*Mapping, Programming (Computers)), (*Programming (Computers), Geography), Maps, Colors, Surveying

Three computer programs for contiguity measures of data associated with areal units are presented. A general discussion of the contiguity measures and test is given. A description, operating instructions, and an empirical application are given for each program. The actual program listings and the data used in the applications are also included. (Author)

**AD-628 184 See Fld. 8/5**

**AD-628 532 See Fld. 8/6**

**AD-628 533 See Fld. 8/6**

## 8/3. DYNAMIC OCEANOGRAPHY

**AD-628 573 Fld. 8/3**
*CALIFORNIA UNIV DAVIS DEPT OF GEOLOGY*
**CAUSES OF RELATIVE SEA-LEVEL CHANGES.**
Technical rept.,
by Charles G. Higgins. 1965, 15p. Rept. no. TR-2, Contract Nonr-2211 (02) Proj. NR-388-070,
Unclassified report

*Availability: Published in American Scientist, v53 n4 p464-76 Dec 1965. Copies to DDC users only.*

Descriptors: (*Tides, Theory), (*Marine geophysics, Tides), Oceanology, Seas, Depth finding

**AD-628 758 See Fld. 8/10**

## 8/4. GEOCHEMISTRY

**AD-628 594 See Fld. 8/7**

## 8/5. GEODESY

**AD-628 184 Fld. 8/5, 8/2, 22/3**
**CFSTI Prices: HC $4.60 MF $0.50**
*BROWN (D) ASSOCIATES INC EAU GALLIE FLA*
**SIMULATIONS OF GEODETIC POSITIONING BY THE METHOD OF CONTINUOUS TRACES.**
Final rept. Apr 65-Jan 66,
by Duane C. Brown. 7 Jan 66, 43p. Rept. no. DBA-321,
Contract AF 19 (628)-5078, Proj. AF-7600 Task 760003,
AFCRL 66-70
Unclassified report

Descriptors: (*Geodesics, Photogrammetry), (*Photogrammetry, Geodesics), (*Satellite tracking systems, Optical tracking), Satellites (Artificial), Astronomical geodesics, Orbital trajectories, Photographic techniques, Position finding, Simulation

The 'Method of Continuous Traces' allows the geodetic positions to be recovered from uninterrupted optical observations of sun-illuminated passive satellites. The observational material for the method consists of sets of photographic plates on which unbroken traces of satellites are recorded against the stellar background. A series of numerical simulations designed to establish quantitatively its theoretical potential are presented. It is found that with suitable and altogether practical geometry, the method of continuous traces is sharply determinate and can recover geodetic positions to extremely high accuracies. Accordingly, it is recommended that a comprehensive computer program be developed to permit full-scale operational testing of the method with actual data. Should the Method of Continuous Traces be found in practice to approach its theoretical expectations, it will clearly have far reaching implications in geodetic photogrammetry. (Author)

**AD-628 797 Fld. 8/5**
**CFSTI Prices: HC $2.60 MF $0.50**
*UPPSALA UNIV (SWEDEN) GEODETIC INST*
**RESEARCH ON METHODS OF DETERMINING LEVEL SURFACES OF THE EARTH'S GRAVITY FIELD.**
Summary rept. no. 2, 1 May-30 Nov 65,
by Erik Tengstrom, and Andreas Vogel. 30 Nov 65, 21p. Contract AF 61 (052)-766, AFCRL 66-76
Unclassified report

Descriptors: (*Geodesics, Gravity), (*Gravity, Geodescis), Instrumentation, Geophysics, Sweden

## 8/6. GEOGRAPHY

**AD-628 418 Fld. 8/6**
**CFSTI Prices: HC $2.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**GUIDE FOR THE TALLIN RESIDENT,**
by Kh. Nuuma. 10 Feb 66, 45p. Rept. no. I-8880,
TT 66-60602
Unclassified report

Trans. of mono. Pamyatka Tallintsu, Tallin, 1965 79p.

Descriptors: (*Eastern Europe, Directories), Urban areas

The purpose of this guide is to acquaint the residents of Tallin with the existing forms of public services for the population and with the location of public service shops, the largest stores of food and industrial products, cultural establishments, municipal enterprises, hospitals, and other institutions and enterprises. In Tallin there are more than four hundred shops and reception points for public service at which the population is rendered all sorts of services, such as the sewing and repair of clothing, the manufacture and repair of footwear, dry cleaning of clothing, repair of household appliances, repair of housing and furniture. (Author)

**AD-628 530 Fld. 8/6, 2/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**THE PHYSIO GEOGRAPHIC ZONING OF THE IRRIGABLE AREA OF CENTRAL ASIA,**
by T. V. Zvonkova. 4 Feb 66, 6p. Rept. no. I-8561-A,
Unclassified report

Voprosy Fiziko-geograficheskogo Raionirovaniya Oroshaiemoi Zony Srednei Azii, trans. of Moscow Univ. Vestnik (USSR) n1 n. p. 1964.

Descriptors: (*Asia, Geography), (*Geography, Asia), Agriculture, Irrigation systems, Surveying, USSR

**AD-628 532 Fld. 8/6, 8/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**CONCERNING THE HISTORY OF ZONING OF RUSSIA,**
by N. V. Andreev. 4 Feb 66, 6p. Rept. no. I-8561-C,
Unclassified report

K Istorii Rayonirovaniya Rossi, trans. of Moscow Univ. Vestnik (USSR) n1 n. p. 1964.

Descriptors: (*USSR, Geography), (*Geography, USSR), Mapping, History

**AD-628 533 Fld. 8/6, 8/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**CHRONICLE: ALL UNION CONFERENCE ON LANDSCAPING IN ALMA-ATA (6TH),**
by G. I. Rychagov, Yu P. Parmuzia, and A. G. Voronov. 4 Feb 66, 7p. Rept. no. I-8561-D
Unclassified report

Khronika: Vsesoiuznoe Soveshchanie po Voprosam Landshaftovedeniya v.g. Alma-Ata (6th), trans. of Moscow Univ. Vestnik (USSR) n1 n.p. 1964.

Descriptors: (*Symposia, Geography), Geology, Mountains, Surveying, USSR, Morphology (Geology)

**AD-628 840 Fld. 8/6**
**CFSTI Prices: HC $1.10 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**TASHKENT IN THE SIXTH FIVE-YEAR PLAN,**
by A. N. Zotov. 3 Feb 66, 5p. Rept. no. I-6656.
Unclassified report

Trans. of mono. Tashkent v Shestoi Pyatiletke, 1958, n.p.

Descriptors: (*USSR, Urban areas), (*Geography, USSR), Economics, Sociology, Industries

Contents: General information; contemporary Tashkent; the future of Tashkent.

**AD-628 841 Fld. 8/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**DEVELOPMENT OF INTERNATIONAL TIES IN THE FIELD OF GEOGRAPHY AND PREPARATION FOR THE INTERNATIONAL GEOGRAPHIC CONGRESS (20TH),**
4 Feb 66, 15p. Rept. no. I-8463-A,
TT 66-60643
Unclassified report

Razvitie Mezhdunarodnykh Svyazei v Oblasti Geografii i Podgotovka k Mezhdnyarodnomu Geograficheskomu Kongressu (20th), trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geograficheskaya, n4 p23-34 1964.

Descriptors: (*Geography, USSR), Scientific organizations, State-of-the-art reviews

**AD-628 842 Fld. 8/6, 4/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**NATURAL RESOURCES, CONSERVATION AND TRANSFORMATION OF NATURE (EXPERIENCE GAINED IN DETERMINING THE INFLUENCE OF LARGE RESERVOIRS ON LOCAL CLIMATE),**
by S. L. Vendrov, and L. K. Malik. 4 Feb 66,
15p. Rept. no. I-8463-B,
TT 66-60644
Unclassified report

Estestvennye Resursy, Okhrana i Preobrazovanie Prirody (Opyt Opredeliniya Vliianiya Krupnykh Vodokhranilishch na Mestnyi Klimat), trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geograficheskaya, n4 p35-46 1964.

Descriptors: (*Climatology, Dams), (*Dams, Climatology), Natural resources, Periodic variations, Atmospheric temperature, Humidity, Inland waterways, Lakes, Meteorology, Geography, Hydrology, USSR

**AD-628 843 Fld. 8/6, 5/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**DEVELOPMENT OF PRODUCTIVE CAPACITY IN ECONOMIC REGIONS OF THE USSR (INTEGRATED EXPLOITATION OF NATURAL RESOURCES IN THE NORTHERN PART OF THE OB' BASIN),**
by D. V. Belorusov. 4 Feb 66, 14p. Rept. no.
I-8463-C
TT 66-60645
Unclassified report

Razvitie Proizvoditelnykh Sil v Ekonomicheskikh Raionakh SSSR (O Kompleksnom Osvoenii Prirodnykh Bogatstv Severnoi Chasti Obskogo Basseina), trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geograficheskaya, n4 p67-78 1964.

Descriptors: (*Geography, USSR), (*Economics, USSR), Industrial production, Electric power production, Fuels, Fuel oil, Gases, Dams, Pipes, Natural resources, Wood, Transportation, Fishes, Industries, Inland waterways, Agriculture, Swamps, Costs

**AD-628 844 Fld. 8/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**A CONSIDERATION OF CERTAIN PREREQUISITES FOR THE INDUSTRIAL DEVELOPMENT OF SMALL AND MEDIUM-SIZE CITIES IN THE CENTRAL ECONOMIC REGION,**
by F. M. Listengurt, and I. M. Smolyar. 4 Feb
66, 13p. Rept. no. I-8463-D
Unclassified report

Izuchenie nekotorykh predposylok promyshlennogo razvitiya malykh i srednikh gorodov tsentral'nogo ekonomicheskogo rayona, trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geofizicheskaya n4 p79-90 1964.

Descriptors: (*USSR, Urban areas), (*Geography, USSR), Industries, Economics, Sociology, Population, Transportation, Urban planning, Water, Manpower studies

Contents: Typology of small and medium size cities; transportation situations; territorial-planning conditions; situation with respect to availability of water; manpower reserves; integrated evaluation of conditions for the development of small and medium-size cities; questions concerning the further study of small and medium-size cities.

**AD-628 845 Fld. 8/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**IMPROVING ECONOMIC DISTRICTING IN THE KAZAKH SSR IN CONNECTION WITH THE DEVELOPMENT OF THE NEW FIVE-YEAR PLAN FOR 1966 - 1970,**
by B. Ya. Dvoskin. 4 Feb 66, 7p. Rept. no. I-8463-E
Unclassified report

Ob uluchshenii ekonomicheskogo raionerovaniya kazakhskoi SSR v svyazi s raarabotkoi novogo pyatiletnego plana na 1966-1970 gg, trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geofizicheskaya n4 p91-6 1964.

Descriptors: (*USSR, Economics), (*Geography, USSR), Political science, Industries, Sociology, Rural areas

Seven years of experience with the sovnarkhozes makes it possible to draw several conclusions and advance suggestions about the advisability of adjusting the boundaries of the economic regions of Kazakhstan for the purpose of obtaining maximum effectiveness from the new system for managing and directing the economy. At the present time here there are two economic regions -- the Semipalatinskiy and the Vostochno-Kazakhstanskiy which complement one another with respect to specialization in production. The advisability of consolidating the Semipalatinsk and Vostochno-Kazakhstan regions is dictated by the need for further curtailment of the administrative-management apparatus. In number of enterprises, volume of gross output, volume of capital investment, and number of workers, Semipalatinskiy Sovnarkhoz occupies last place in Kazakhstan. On the other hand, in number of workers in the apparatus needed for every 1,000 laborers the Semipalatinskiy Sovnarkhoz, along with the ZapadnoKazakhstanskiy Sovnarkhoz, leads all other sovnarkhozes (4.55 persons in comparison with 3.4 persons on the average for the republic). The rearrangement of the management and direction of the economy and the formation of consolidated rural regions (production administrations) which took place following the November Plenum of the Central Committee of the CPSU facilitates combining the present Severo-Kazakhstanskaya and Kokchetavskaya Oblasts.

**AD-628 847 Fld. 8/6, 5/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**NEWS ITEMS (CONGRESS OF GEOGRAPHERS OF THE UKRANIAN SSR (1ST)),**
by A. M. Marinich. 4 Feb 66, 18p. Rept. no. I-8463-G
Unclassified report

Khronika (Pervyi sezd geografov ukrainskoi. Trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geofizicheskaya n4 p156-66 1964.

Descriptors: (*Geography, Symposia), (*USSR, Geography), Scientific organizations, Economics, Agriculture, Population, Manpower studies, Geology, Hydrology, Oceanology, Meteorology, Urban areas, Reports

**AD-628 150 See Fld. 8/7**

**AD-628 611 See Fld. 9/2**

## 8/7. GEOLOGY AND MINERALOGY

**AD-628 080 Fld. 8/7, 22/2, 14/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*BOSTON COLL CHESTNUT HILL MASS*
**PHOTOGEOLOGY OF THE SAHARA AND THE KALAHARI FROM TIROS,**
by James W. Skehan, S. J. Arabasz, and Walter J. Arabasz. 15 Dec 65, 49p. Rept. no. Scientific-1, Contract AF 19 (628)-3990, Proj. AF-7628, Task 762805,
AFCRL 65-229
Unclassified report

Descriptors: (*Photogeology, Africa), (*Africa, Photogeology), (*Satellites (Artificial), Photogeology), Saharan Africa, Subsaharan Africa, Deserts, Aerial photography, Meteorological satellites

Photogeologic analysis of TIROS photography of the Sahara and Kalahari regions of western Africa demonstrate the limited applicability of such satellite photography to geologic studies of Earth. (Author)

**AD-628 150 Fld. 8/7, 8/6**
**CFSTI Prices: HC $6.00 MF $1.25**
*PACIFIC SCIENCE BOARD NATIONAL RESEARCH COUNCIL WASHINGTON D C*
**TERRESTRIAL SEDIMENTS AND SOILS OF THE NORTHERN MARSHALL ISLANDS,**
by F. Raymond Fosberg, and Dorothy Carroll.
31 Dec 65, 257p. Rept. no. Atoll Research Bull-113,
Contract Nonr-2300 (12)
Unclassified report

Descriptors: (*Marshall Islands, Geology), (*Geology, Marshall Islands), (*Soils, Marshall Islands), Sedimentation, Geography, Pacific Ocean islands, Geochemistry

An investigation was made of surface geology, islet formation, sedimentation, and physical and

chemical nature of loose sediments on atolls of the northern Marshall Islands.

**AD-628 163 Fld. 8/7, 8/11**
**CFSTI Prices: HC $1.00 MF $0.50**
*GEOLOGICAL SURVEY DENVER COLO*
**SEISMIC STUDY OF CRUSTAL STRUCTURE IN THE SOUTHERN ROCKY MOUNTAINS.**
Technical Letter Crustal Studies,
by W. H. Jackson, and L. C. Pakiser. 26 Jan 66, 9p. Rept. no. TL-42,
Contract ARPA Order-193-65,
Unclassified report

Descriptors: (*Seismology, Colorado), (*Mountains, Colorado), (*Geology, Colorado), Underground explosions, Seismic waves, Propagation, Geophysical prospecting, Wyoming, Utah

Two underground mining blasts of 25,500 pounds and 416,235 pounds of explosives, detonated at Climax, Colo., on May 21 and 23, 1964, were recorded at 17 locations in the Front Range uplift of the Southern Rocky Mountains at distances ranging from 25 to 360 km north of the shotpoint. Strong secondary events recorded at distances ranging from 119 to 192 km from the shotpoint were identified as reflections from the Mohorovicic discontinuity and from an intermediate layer in the crust. An analysis of both reflected and refracted events suggests that the crustal thickness north of Climax is approximately 54 km and that it decreases abruptly by about 15 km in the area directly east of the Uinta Mountains. Comparison of crustal models in the different geologic and physiographic provinces of the Far West indicates that isostatic compensation is related primarily to density variations in the upper mantle and only secondarily to variations in crustal thickness. (Author)

**AD-628 463 Fld. 8/7, 8/11**
*CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB*
**CRUSTAL STRUCTURE IN EAST ANTARCTICA FROM SURFACE WAVE DISPERSION,**
by Gilbert Dewart, and M. Nafi Toksoz. 26 Jun 64, 14p.
Unclassified report

*Availability: Published in Geophysical Journal of Royal Astronomical Society, v10 n2 p127-39. Copies to DDC users only.*

Descriptors: (*Structural geology, Antarctic regions), (*Antarctic regions, Structural geology), Seismology, Lithosphere, Seismic waves, Propagation, Geophysical prospecting

The structure of the Earth's crust and the upper mantle in East Antarctica are investigated using the dispersion properties of both the Love and the Rayleigh waves. The group velocities of surface waves between 15 and 70 sec periods are measured over several paths crossing Antarctica from Sandwich Arc and Drake Passage to stations of Wilkes and Mirny. Theoretical dispersion curves are computed for various crust and upper mantle models. The structure that fits the Rayleigh and Love wave data equally well is charactized by a 42 km thick crust and low (7.85 km/sec) sub-Moho velocities. The average thickness of the ice layer over East Antarctica, between Princess Martha Coast and Wilkes Station, is determined to be about 3 km. The general problem of non-uniqueness in group velocity inversion is also discussed. (Author)

**AD-628 513 Fld. 8/7**
**CFSTI Prices: HC $2.60 MF $0.50**
*COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER N H*
**ON THE MODE OF UPLIFT OF THE FISH AND FOSSILIFEROUS MORAINES OF THE MCMURDO ICE SHELF, ANTARCTICA.**
Research rept.,
by A. J. Gow, W. F. Weeks, G. Hendrickson, and R. Rowland. Oct 65, 23p. Rept. no. RR-173, Task 1V014501B52A31,
Unclassified report

Descriptors: (*Ice, Geology), (*Antarctic regions, Geology), Paleontology, Petrography, Stratigraphy, Geochemistry, Glaciers, Fishes, Distribution

The McMurdo Ice Shelf and associated faunal remains were examined in the vicinity of the easternmost Dailey Island. Stratigraphic, petrographic, and chemical composition studies of cores from 2 holes drilled through the ice shelf show that at these locations the shelf is composed only of fresh water ice. Although cores from the deeper hole possessed glacial textures throughout, much of the ice from this part of the McMurdo Ice Shelf may have been formed from the freezing of a layer of fresh water found sandwiched between the shelf bottom and the underlying sea water. The existence of fresh water under the ice shelf can most probably be attributed to drainage of surface melt water during the ablation season. There was no evidence to indicate that this part of the ice shelf is being nourished by the growth of sea ice onto its lower surface. The fish remains found on the ice surfaces were confined to a narrow zone along the tide crack and are believed to have been left in this vicinity by deep diving seals. The marine invertebrate remains on top of the ice are associated with morainal material and are believed to have been incorporated into the ice at the time of formation of the moraines. (Author)

**AD-628 594 Fld. 8/7, 8/4**
*CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS*
**XENON AND KRYPTON IN THE BRUDERHEIM METEORITE,**
by Craig Merrihue. 27 Sep 65, 51p.
Unclassified report

*Availability: Published in Journal of Geophysical Research, v71 n1 p263-313 Jan 1 1966. Copies to DDC users only.*

Descriptors: (*Xenon, Meteorites), (*Krypton, Meteorites), (*Meteorites, Chemical analysis), Petrology, Extraterrestrial topography, Geochemistry

**AD-628 644 Fld. 8/7**
*CALIFORNIA UNIV DAVIS DEPT OF GEOLOGY*
**GREECE, A SKETCH FOR GEOLOGISTS.**
Technical rept.,
by C. G. Higgins. 1 Feb 66, 5p. Rept. no. TR-1,
Contract Nonr-2211 (02), Proj. NR-388-070,
Unclassified report

*Availability: Published in Geotimes, v10 n5 p16-7 Dec 1965-Jan 1966. Copies to DDC users only.*

Descriptors: (*Greece, Geology), (*Geology, Greece), State-of-the-art reviews

State-of-the-art review of geological research in Greece.

**AD-628 695 Fld. 8/7**
**CFSTI Prices: HC $5.60 MF $0.50**
*GEOSCIENCE INC CAMBRIDGE MASS*
**RESULTS OF DEEP RESISTIVITY MEASUREMENTS IN SIX PRECAMBRIAN AREAS OF THE WESTERN U. S.**
Scientific rept. no. 7, May-Dec 65,
by Howard S. Lahman, Arnold Orange, and Keeva Vozoff. Dec 65, 56p. Contract AF 19 (628)-2351, Proj. AF-4600, Task AF-460008, AFCRL 66-27
Unclassified report

See also AD-618 211.

Descriptors: (*Earth (Planet), Electrical properties), (*Resistance (Electrical), Lithosphere), (*Lithosphere, Resistance (Electrical)), Geophysics, Geophysical prospecting, Igneous rock, Metamorphic rock, Oklahoma, Colorado, Wyoming, Montana, North Dakota

Surface resistivity surveys over extensive outcrops of precambrian igneous and metamorphic rocks were conducted in Oklahoma, Colorado, Wyoming, Montana, and North Dokota. In all areas the resistivities encountered were less than 100,000 ohm-meters, with the possible exception of North Dakota, where the igneous basement may have been masked by 2,000 feet of highly conductive sediments. Except in North Dakota, all the areas were found to be complicated at moderate depth by inhomogeneities or structural features which gave rise to low values of apparent resistivity. In general the surveys reflected lateral variations in geology. (Author)

**AD-628 798 Fld. 8/7**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**FAULT PLANE FEATURES: AN ALTERNATIVE EXPLANATION.**
Environmental research papers,
by R. E. Riecker. 3 Sep 64, 10p. Rept. no. AFCRL-ERP-165,AFCRL-65-916
Proj. AF-7639, Task 763905,
Unclassified report

*Availability: Published in Journal of Sedimentary Petrology p746-48 3 Sep 1964. Copies to DDC users only.*

Descriptors: (*Faults (Geology), Theory), Rock (Geology), Motion, Friction, Shear stresses, Seismology, Geophysics

Traditional interpretation of steplike breaks observed on slickensided fault plane surfaces frequently conflicts with known relative displacements. Laboratory tests on thin mineral pellets compressed and sheared between opposed anvils develop steeper sides on projections which face the oncoming opposed surface. The step vertical surfaces develop as a result of the violent rebound and spalling of stressed projections on the sheared surface during 'stick-slip' motion. It is suggested that similar fault plane features may indicate relative fault block movement, but in a sense opposite that traditionally assumed. (Author)

**AD-628 860 Fld. 8/7, 14/2, 17/10**
**CFSTI Prices: HC $3.00 MF $0.75**
*BUREAU OF MINES DENVER COLO*
**DEVELOPMENT OF CONTROLLED IMPULSE TECHNIQUE FOR IN SITU TESTING OF ROCK.**
Technical rept., Jun 64-Jul 65,
by Francis X. Cannaday, and G. M. Leo. Feb 66, 98p. Contract AF 29 (601)-64-PO-10, Proj. AF-5710,
AFWL TR-65-156
Unclassified report

Descriptors: (*Rock (Geology), Ultrasonic radiation), (*Test methods, Ultrasonic radiation), (*Ultrasonic radiation, Test methods), Granite, Salts, Piezoelectric transducers, Ores (Metal sources), Copper, Potassium compounds, Oscillographs, Test equipment (Electronic), Rock salt

Object of the work is development of equipment and techniques for transmission of nondestructive, repetitive, stable, closely controlled-shape sonic pulses through various types of rock in place. Rock masses tested were granitic gneiss schist, potash rich salt beds, and porphyry-copper ore. The tests measure some physical properties of a rock mass over various periods of time. Sonic pulses are produced by electronically excited, piezoelectric-ceramic transducers housed in transmitter and receiver units. Electronic pulses for transducer excitation are generated by transistorized battery -powered pulse generators. Output from receiver units (or geophones), amplified by transis-

torized preamplifiers, is led into a portable transistorized oscilloscope triggered by the electronic pulse generator to display the signal. Various models of transmitter and receiver units differing in size, weight and manner of insertion into boreholes in rock are described. Two models of electronic pulse generators and a receiving unit preamplifier are described. Transmission distances attained varied from 55 feet in strongly hydrothermally altered porphyry copper ore to 1,373 feet in sylvitehalite. Data obtained could be used to compute dynamic moduli of rigidity and elasticity. Under proper conditions, data were obtained that revealed development or presence of permanent rock-structure damage. (Author)

**AD-628 068 See Fld. 8/11**

**AD-628 458 See Fld. 8/11**

**AD-628 490 See Fld. 8/11**

**AD-628 604 See Fld. 20/2**

**AD-628 786 See Fld. 8/14**

**AD-628 787 See Fld. 8/14**

## 8/8. HYDROLOGY AND LIMNOLOGY

**AD-628 846 Fld. 8/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**IN INTERNATIONAL SCIENTIFIC ORGANIZATIONS (AUSTRALIAN SYMPOSIUM ON WATER RESOURCES),**
by L. V. Dunin-Barkovskii, and V. N. Kunin. 6 Feb 66, 11p. Rept. no. I-8463-F
Unclassified report

V mezhdunarodnykh nauchnykh organizatsiyakh (Avstraliiskii simpozium po vodnym resursam), trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Geofizicheskaya n4 p146-52 1964.

Descriptors: (*Australia, Hydrology), (*Hydrology, Australia), Atmospheric precipitation, Moisture, Evaporation, Rivers, Irrigation systems, Water supplies, USSR

The National Symposium on the Use and Management of Water Resources took place from 9 to 13 September 1963 in the city of Canberra. At the symposium there were present, evidently, almost all prominent experts in Australia who are concerned with the study of water and moisture in all their forms in Australia (water in the atmosphere and ground, surface, and subsurface) as well as the use of water and moisture in all spheres of economic activity. A total of 40 reports was given during the symposium. The reports were grouped according to the following subjects (the figures show number of reports): future national prospects -- 6; basic data: precipitation -- 2, evaporation -- 3, surface waters -- 3, subsurface waters -- 4, methods used to process data -- 3; water balance: principles and analyses -- 6, use -- 5; social-economic problems -- 4; analyses and research -- 4; formation -- 2. Moreover, discussions took place concerning the International Hydrological Decade conducted under the aegis of the UN and UNESCO. (Author)

**AD-628 548 See Fld. 13/2**

## 8/10. PHYSICAL OCEANOGRAPHY

**AD-628 145 Fld. 8/10**
*DIRECTORATE OF PHYSICAL RESEARCH DEFENCE RESEARCH BOARD OTTAWA (ONTARIO)*
**ON THE OCEANOGRAPHY OF THE NANSEN SOUND FIORD SYSTEM,**
by G. Hattersley-Smith, and William L. Ford. Jan 66, 15p. Rept. no. Reprint-2574,
Unclassified report

Prepared in cooperation with Bedford Inst. of Oceanography, Dartmouth (Nova Scotia).

*Availability: Published in 'Arctic' Journal of the Arctic Inst. of North America v18 n3 p159-71 Sep 1965.*

Descriptors: (*Ellesmere Island, Sounds), (*Sounds, Ellesmere Island), (*Oceanology, Arctic regions), Arctic Ocean, Oceanographic data

The term Nansen Sound fiord system is used in this paper to describe that considerable body of water located for the most part above 80 degrees N, latitude off northwest Ellesmere Island. The main stem stretching some 210 nautical miles from Gregely Fiorde and Tanquary Fiord from which nine major branches extend out from 20 to as much as 60 miles. While the system may be looked upon as stemming mainly from the Arctic Ocean, it does have a second connection to the outside through the 160 mile length of Eureka Sound, the northern end of which joins Nansen Sound and Greely Fiord.

**AD-628 147 Fld. 8/10**
**CFSTI Prices: HC $1.60 MF $0.50**
*NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C*
**METHODS OF EVALUATING ADVECTION IN THE HEAT BALANCE OF SEAS AND OCEANS,**
by V. S. Samoilenko. 1965, 20p. Rept. no. TRANS-256,
TT 66-60552
Unclassified report

Metody Otsenki Advektsii v Teplovom Balanse Morei i Okeanov, trans. of Akademiya Nauk SSSR. Institut Okeanologii. Trudy, v66 p46-58 1963.

Descriptors: (*Oceanology, Heat transfer), (*Heat transfer, Oceanology), Seas, Oceans, Heat flux, Marine meteorology

The article contains a review and analysis of direct and indirect methods for the estimation of advective and turbulent heat influx in the seas and oceans. Some examples of practical application of these methods are discussed as well. (Author)

**AD-628 192 Fld. 8/10**
**CFSTI Prices: HC $5.60 MF $0.50**
*DEPARTMENT OF THE NAVY WASHINGTON D C*
**TRAVELING ON THE BOTTOM OF THE SEA; HOW THE RELIEF OF OCENA AND SEA BOTTOM IS FORMED,**
by A. N. Larionova. 1966, 51p. Rept. no. Translation-765,
TT 66-60555
Unclassified report

Trans. of Unidentified mono. Leningrad, 1959 p20-70.

Descriptors: (*Ocean bottom topography, Orogeny), (*Orogeny, Ocean bottom topography), Marine geology, Theory

**AD-628 242 Fld. 8/10**
*SCRIPPS INSTITUTION OF OCEANOGRAPHY UNIV OF CALIFORNIA LA JOLLA*
**CARBON DIOXIDE IN SURFACE WATERS OF PACIFIC OCEAN. I. MEASUREMENTS OF THE DISTRIBUTION.**
Revised ed.,
by Charles D. Keeling, Norris W. Rakestraw, and Lee S. Waterman. 3 Aug 65, 12p. Contract Nonr-2216 (23),NSF-G6542 Proj. NR-083-005,
Unclassified report

Revision of manuscript submitted 14 Dec 64.

*Availability: Published in Journal of Geophysical Research v70 n24 p6087-97 15 Dec 1965. Copies to DDC users only.*

Descriptors: (*Carbon dioxide, Pacific Ocean), (*Pacific Ocean, Carbon dioxide), Seawater, Oceans, Surface area, Gas analysis

Direct measurements of carbon dioxide in surface waters of the Pacific Ocean from 30 degrees N to 65 degrees S indicate high concentration relative to atmospheric CO2 in a broad belt near the equator and approaching the coast of South America. Elsewhere the concentration has been generally found to be nearly in equilibrium with the atmosphere or somewhat lower. (Author)

**AD-628 249 Fld. 8/10**
**CFSTI Prices: HC $4.00 MF $0.75**
*UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF GEOLOGY*
**GEOLOGIC STUDIES OF SOUTHERN CALIFORNIA SUBMARINE CANYONS.**
Annual summary rept. 1 Feb 65-30 Jan 66,
by Harold D. Palmer, and Donn S. Gorsline. Dec 65, 111p. Rept. no. USC-GEOL-65-4,
Contract Nonr-228 (17), Proj. NR-083-144,
Unclassified report

Descriptors: (*Marine geology, California), (*Pacific Ocean, Ocean bottom topography), (*Ocean bottom topography, Pacific Oceans), Maps, Terrain, Seacoast, Ocean bottom sampling, Clay minerals

This report summarizes the data collected to the date of the report on the bathymetry, sediments and structure of the submarine canyons off southern California. Bathymetric maps of all canyons are included as are location maps of samples collected by coring, dredging or surface grabs. Some clay mineral analyses are reviewed as a preliminary report on a larger continuing study. The canyons of the California Borderland may well be much more recent than has previously been supposed. Most probably owe their present expression to middle or late Pleistocene diastrophic activity. (Author)

**AD-628 758 Fld. 8/10, 8/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS*
**BIBLIOGRAPHY OF REPORTS 1965,**
by Cecelia B. Fuglister. Jan 66, 14p. Rept. no. Ref-65-67,
Unclassified report

Descriptors: (*Oceanology, Bibliographies), Marine meteorology, Marine geophysics, Oceanographic data, Reports

Bibliography of oceanographical reports.

**AD-628 866 Fld. 8/10, 8/13**
**CFSTI Prices: HC $4.00 MF $1.00**
*ARMY COASTAL ENGINEERING RESEARCH CENTER WASHINGTON D C*
**SAND MOVEMENT ALONG A PORTION OF THE NORTHERN CALIFORNIA COAST.**
Technical memo.,
by John Cherry. Oct 65, 129p. Rept. no. TM-14,
Unclassified report

Descriptors: (*California, Beaches), (*Sand, Beaches), Water, Sedimentation, Water waves

Long-term beach and offshore sand movement along the northern California coast between Drakes Bay and Russian River is studied. Analysis of wave, sand and geological data, coupled with

known configurations and behavioral processes of stable beaches, suggests little net alongshore movement under present conditions and that beaches are generally in equilibrium with negligible loss. This analysis is confirmed through heavy mineral analysis of surface samples. Point Reyes and Bodega Head are indicated to be effective littoral barriers to alongshore transport. (Author)

**AD-628 868 Fld. 8/10, 8/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*NORTHWESTERN UNIV EVANSTON ILL*
**A LOGNORMAL SIZE DISTRIBUTION MODEL FOR ESTIMATING STABILITY OF BEACH FILL MATERIAL.**
Technical memo.,
by W. C. Krumbein, and W. R. James. Nov 65, 21p. Contract DA-49-055-CIVENG-64-15, CERC TM-16

Unclassified report

Descriptors: (*Beaches, Particle size), (*Sand, Particle size), Sedimentation, Mathematical models, Analysis, Stability, Distribution

An analytical approach to the problem of estimating the 'extra amount' of beach fill needed when available borrow material is finer than native sand composing the beach area is discussed. A mathematical solution is offered for those cases where borrow material is less well-sorted than native beach material. If fill is better sorted, it is shown that there is no direct mathematical solution and required fill quantities must be based on past experience and empirical procedures. Mathematical theory underlying the method of analysis is based on a simple model assuming lognormalcy of particle size distributions. A 'critical ratio' of amount of borrow material needed to produce the size distribution of the native sand is defined such that when the ratio has a maximum, the problem can be solved. (Author)

**AD-628 195** **See Fld. 8/1**

**AD-628 275** **See Fld. 8/11**

**AD-628 304** **See Fld. 20/1**

**AD-628 782** **See Fld. 14/2**

## 8/11. SEISMOLOGY

**AD-628 068 Fld. 8/11, 8/7**
**CFSTI Prices: HC $1.00 MF $0.50**
*TECHNISCHE HOCHSCHULE KARLSRUHE (WEST GERMANY) GEOPHYSIKALISCHES INSTITUT*
**INVESTIGATIONS ON THE NONELASTIC BEHAVIOR OF THE UPPER MANTLE.**
Quarterly narrative progress rept. (scientific rept.), no. 1, 1 May-31 Jul 65,
by Stephan Mueller, and Karl Fuchs. 15 Aug 65, 20p. Contract AF 61 (052)-861, Proj. AF-9714, AFOSR 65-2939

Unclassified report

Descriptors: (*Seismology, West Germany), Lithosphere, Seismic waves, Propagation, Structural geology, Earth models

The distorting effect of the earth's crust on the spectrum of seismic signals which are transmitted from the source through the mantle to the receiving station is discussed. In an attempt to correct for the influence of the 'receiver-crust' a crustal model for the region of the Grafenberg Observatory (GGGR) near Nurnberg, Germany, has been derived. Its main features are a positive velocity gradient at the top of the crystalline basement, a low-velocity channel at a depth of about 10 km, and the possible existance of a high-velocity layer just above the MOHOROVICIC discontinuity. The presence of this layer could be detected from the spectra of body waves. (Author)

**AD-628 148 Fld. 8/11, 17/10**
**CFSTI Prices: HC $8.60 MF $0.75**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**GEOMETRY AND PATTERNS OF LARGE APERTURE SEISMIC ARRAYS.**
Technical note,
by R. T. Lacoss. 31 Dec 65, 86p. Rept. no. TN-1965-64,
Contract AF 19 (628)-5167 ,ARPA Order-512
ESD TDR-65-596

Unclassified report

Descriptors: (*Seismometers, Site selection), (*Seismology, Instrumentation), Montana, Seismological stations, Nuclear explosions, Underground explosions, Detection

A study of possible configurations for a Large Aperture Seismic Array has been completed. An array having 21 identical subarrays located on three concentric circles has been found to yield the most satisfactory pattern in wave number space of all the configurations tested. Patterns for some alternative placements of subarrays, including that of the experimental LASA in Montana, have been included in this report. This study of patterns in wave number space has yielded the suggestion that a LASA having a diameter of 200 km should be composed of subarrays from 10 to 15 km in diameter. Such an increase of subarray size above the 7 km diameter subarrays of the experimental LASA would require the use of less regular subarray geometries than those which have been used in Montana. A sensitivity function for patterns has been developed. This function can be used to predict the change in patterns which might result from changes in seismometer or subarray positions. Since the sensitivity function predicts possible changes in patterns, it can be used to set bounds upon changes in an array which can be made without severely changing the pattern. The tight bounds imposed by the sensitivity function can be relaxed if the pattern resulting from any anticipated change in position is actually computed. Since very little computer time is required to compute a pattern, this procedure is highly recommended. (Author)

**AD-628 275 Fld. 8/11, 8/10**
*MICHIGAN UNIV ANN ARBOR INST OF SCIENCE AND TECHNOLOGY*
**ATTENUATION OF PN FROM OFFSHORE MAINE EXPLOSIONS,**
by G. E. Frantti. 19 Nov 64, 9p. Contract AF 49 (638)-1170 ,AF 49 (638)-911
AFOSR 65-2910

Unclassified report

*Availability: Published in Bulletin of the Seismological Society of America v55 n2 p417-23 Apr 1965. Copies to DDC users only.*

Descriptors: (*Seismology, Maine Gulf), (*Maine Gulf, Seismology), Underwater explosions, Seismic waves, Propagation, Attenuation, Marine geophysics

The attenuation of P sub n based on seismic energy density in a three-second time window was examined as a function of frequency in the distance range 204.0 < or = delta < or = 346.4 km for underwater explosions in the Gulf of Maine. The diffracted P wave contained energy in the approximate frequency interval 1.25 to 20 cps and attenuation over this portion of the spectrum exhibited an unusual frequency-dependence with littel scatter in the data. Dissipation constants are estimated from these observations. Integration of the extrapolated energy spectrum suggests empirically that the seismic source efficiency is about 8 per cent. (Author)

**AD-628 385 Fld. 8/11**
**CFSTI Prices: HC $39.20 MF $1.75**
*TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV*
**BASIC RESEARCH IN CRUSTAL STUDIES.**
Final rept., 1 Sep 63-31 Dec 65,
by Milo M. Backus, and Stanley J. Laster. 31 Dec 65, 396p. Contract AF 49 (638)-1244 ,ARPA Order-292-63

Unclassified report

Descriptors: (*Seismology, Earth models), Structural geology, Seismic waves, Propagation, Simulation, Analog systems, Nuclear explosions, Underground explosions, Detection, Seismographs, Geophysics

The work falls into four tasks: (1) single-layer models; (2) multilayer models; (3) models with layer thickness variation; and (4) experimental studies using field data. The single-layer studies included theoretical investigation of normal and leaking modes, studies of the practical aspects of frequency-wavenumber analysis and investigation of mode separation by multichannel filtering. Theoretical and analog model investigations for two layers over a half-space showed the difficulty in directly observing an intermediate velocity layer using frequencies of 0.5 cps or less. Analog model investigations of a model having a dipping M-discontinuity showed a wide range of phase velocities for ray events, as predicted. Experimental studies of field data showed the usefulness of velocity filtering as an interpretive aid. Correlation statistics for small events showed that only about 50 percent of the energy arriving between the first arrival and surface waves is predictable. For events at small distance (delta < 30 km), Rayleigh-mode dispersion curves were measured. These suggested low near-surface velocities extending to a depth of 1/2-km. It was found that receiving arrays inline with the shot are necessary for adequate dispersion measurements. (Author)

**AD-628 458 Fld. 8/11, 8/7**
*LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y*
**THE USE OF LEAKING MODES IN SEISMOGRAM INTERPRETATION AND IN STUDIES OF CRUSTMANTLE STRUCTURE,**
by Sergio S. Su, and James Dorman. 22 Mar 65, 36p. Rept. no. scientific-5,
Contract AF 19 (628)-4082,ARPA Order-292
Proj. AF-8652, Task AF-865201,
AFCRL 66-69

Unclassified report

*Availability: Published in Bulletin of the Seismological Society of America, v55 n6 p989-1021 Dec 1965. Copies to DDC users only.*

Descriptors: (*Seismology, Structural geology), (*Structural geology, Seismology), Lithosphere, Seismic waves, Propagation, Geophysical prospecting

Dispersed wave trains appearing in the interval between P and S at moderate epicentral distances are identified as higher leaking modes. Normally dispersed wave trains with periods from 7 to 5 seconds and from 12 to 9 seconds are commonly observed at distances less than 20 degrees, while a few examples of inversely dispersed wave trains with periods 15 to 35 seconds have been observed at distances as great as 50 degrees. The latter type of wave has group velocities between 7 and 8.5 km/sec and is sensitive to impressional velocity structure in the upper mantle. PL and shear coupled PL waves were observed on two South American paths. Analysis of these wave trains gives a value of crutal thickness, which agrees well with results from Rayleigh waves. Haskell's method is used for obtaining leaking mode dispersion curves. Results agree well with those of Gilbert and Oliver and Major, but the present method provides information on particle motion and relative amplitude of the predicted arrivals, which is useful in seismogram interpretation. (Author)

**AD-628 490 Fld. 8/11, 8/7**
**CFSTI Prices: HC $10.60 MF $0.75**
*MINNESOTA UNIV MINNEAPOLIS DEPT OF GEOLOGY AND GEOPHYSICS*
**SEISMIC STUDIES ON THE ALASKAN COASTAL PLAIN.**
Final rept.,
by Harold M. Mooney. Jan 66, 103p. Rept. no. 4, Contract Nonr-710 (44), Proj. NR-307-271,
Unclassified report

Descriptors: (*Alaska, Seismology), (*Seismology, Alaska), Geology, Lithosphere, Seismic waves, Propagation, Geophysical prospecting, Underground explosions

Results are presented (or referenced from earlier reports) for three seasons, 1961-1963, of seismic field work in the vicinity of Point Barrow, Alaska. Seismic refraction data are interpreted in terms of a shallow geologic section near Point Barrow and a crustal section based upon a 280 kilometer profile northwestward from Point Barrow. The former yields velocities of 2.5, 3.1 and 4.8 km/sec with depths to top of 0, 0.4, and 1.0 kilometers. The latter has been interpreted on the basis of three geological models; all include a shallow section with thickness 10-12 kilometers and velocity 4.96 km/sec, an intermediate section with velocity 6. 1-6.6 km/sec, and a high-velocity refractor with velocity 7.56 km/sec at a depth of 28-32 kilometers. Evidence is cited to support the interpretation of the high-velocity refractor as the top of the earth's mantle. Seismic noise analyses were carried out on 14 of 90 available records taken at a location 50 kilometers southwest of Point Barrow. Displacement spectra in the 2-32 cps range were computed for each of the 6 vertical geophones on a 4-km spread. Phase spectra and coherence were determined for a three-component station. Six second noise samples were used, digitized at 0.01 second intervals. (Author)

**AD-628 829 Fld. 8/11**
*INSTITUTE OF GEOPHYSICS AND PLANETARY PHYSICS UNIV OF CALIFORNIA SAN DIEGO*
**EARTH NOISE, 5 TO 500 MILLICYCLES PER SECOND. 2. REACTION OF THE EARTH TO OCEANS AND ATMOSPHERE,**
by Richard A. Haubrich, and Glenn S. MacKenzie. 16 Nov 64, 14p. Contract AF-AFOSR-62-420, Proj. AF-8652,
AFOSR 65-2899
Unclassified report

*Availability: Published in Journal of Geophysical Research v70 n6 p1429-40 Mar 15, 1965. Copies to DDC users only.*

Descriptors: (*Microseisms, Earth), Ocean waves, Atmosphere, Storms, Measurement, Geophysics, Identification, Noise, Superlow frequency

Sources of earth noise have been identified and located for different parts of the frequency band from 5 to 500 mc/s. In the typical microseism bands around 75 and 150 mc/s, sources are associated with storm waves arriving at both distant and local sea coasts. During the winter months the primary-frequency microseisms measured at La Jolla come mostly Double-frequency microseism sources are generally within a few hundred kilometers of La Jolla, but more distant sources have also been observed. In addition, both ocean and atmosphere produce local loading which becomes significant at frequencies below the storm microseism band.

**AD-628 883 Fld. 8/11**
**CFSTI Prices: HC $6.60 MF $0.75**
*GEOTECH DIV TELEDYNE INDUSTRIES INC GARLAND TEX*
**STUDY OF SHORT-PERIOD SEISMIC NOISE.**
Semiannual technical summary rept. no. 7, 1 Jul31 Dec 65,
by E. J. Douze. 15 Feb 66, 66p. Rept. no. TR-66-13,
Contract AF 49 (638)-1150,
Unclassified report

Descriptors: (*Microseisms, Mathematical analysis), Seismology, Seismic waves, Earthquakes, Data processing systems, Statistical analysis

Studies of short-period seismic noise were conducted and are presented. Studies that are in progress are: a study of higher mode surface waves from earthquakes and a study of the 2 cps peak in noise. The status of the special orientation program is discussed and a schedule for completion of this task is given. Appendix 1 presents a summary of the results obtained over the last few years in the study of the types of waves present in short-period seismic noise. Appendix 2 presents an almost completed study on the statistics of short-period noise. (Author)

**AD-628 163** **See Fld. 8/7**

**AD-628 463** **See Fld. 8/7**

**AD-628 765** **See Fld. 20/11**

## 8/12. SNOW, ICE, AND PERMAFROST

**AD-628 278 Fld. 8/12**
**CFSTI Prices: HC $2.60 MF $0.50**
*NAVAL RESEARCH LAB WASHINGTON D C*
**THE ADHESION OF ICE TO HYDROPHOBIC SURFACES.**
Interim rept.,
by W. D. Bascom, R. L. Cottington, and C. R. Singleterry. 14 Jan 66, 28p. Rept. no. NRL-6350, Proj. SF-013-99-02-0519 ,RR-001-01-43-4750
Unclassified report

Descriptors: (*Ice, Adhesions), (*Surface properties, Ice), Steel, Organic coating, Substrates, Polymers, Fracture (Mechanics), Crystal structure, Crystal lattice defects, Deicing systems

Determinations were made on the adhesional shear strength of ice formed against clean, highly polished steel, against close-packed monolayers adsorbed on steel, and against thin coatings of organic polymers painted on metal surfaces. The adsorbed monolayers reduced the shear strength by about one third of that for ice against clean steel. The values of the shear strength for the different monolayers were approximately the same despite a wide difference in the chemical constitution of the adsorbates. The monolayers also had the effect of changing the character of the breaks from clearly cohesional, ductile fractures from clean steel to apparently adhesional, brittle fractures from the monolayers. On lightly abraded steel the results were quite different from those on the highly polished surfaces - the adhesion was noticeably higher and the breaks were cohesional for both clean and monolayer-coated abraded surfaces. The shear strength against the organic coatings ranged from values equal to that of ice against clean steel to values 70 to 80% lower. These results showed no simple correlation with the water contact angle on the organic coatings. The appearance of the ice separated from the various substrates was examined by forming plastic replicas against the ice surface. These replicating solutions etched the ice to reveal crystal structure and crystal lattice defects. The etching features showed the ice lattice to be highly defective near the substrate. (Author)

**AD-628 531 Fld. 8/12**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**THE MECHANISM OF ACTION OF FIRNS ON THEIR BEDS,**
by V. G. Chigir. 4 Feb 66, 7p. Rept. no. I-8561-B
Unclassified report

O Mekhanizme Vozdeistviya Snezhnikov na Ikh Lozhe, trans. of Moscow Univ. Vestnik (USSR) n1 n. p. 1964.

Descriptors: (*Snow, Glaciers), (*Glaciers, Snow), Motion, USSR, Surfaces, Temperature, Melting

Results are presented of 1957-1959 observations of the firns on the Severnaya Zemlya archipelago.

**AD-628 536 Fld. 8/12, 4/2**
**CFSTI PricesMF $1.00**
*NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C*
**REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM, 1964.**
Special pub. (Annual rept. no. 13).
Dec 65, 191p. Rept. no. SP-70 (64)
Unclassified report

See also AD-620 875.

*Availability: Available from U. S. Naval Oceanographic Office, Washington, D. C. 20390 $1.50.*

Descriptors: (*Ice, Arctic regions), (*Arctic regions, Ice), (*Oceanology, Arctic regions), Aerial reconnaissance, Ice islands, Navigation charts, Meteorology, Climatology

The ice program conducted by the Oceanographic Office during 1964 is covered by this report. Methods of data collection and dissemination, a report of ice forecasting and reconnaissance, and concomitant ice projects are discussed. A graphic summary of ice data and oceanographic stations collected in the North American Arctic from the Bering Sea to the Denmark Strait is given for January through December. Aerial ice reconnaissance data collected in Canadian and Greenland waters by Canada and Denmark, respectively, and surface and shore observations made by Canadian and United States ships are included. (Author)

**AD-628 548** **See Fld. 13/2**

## 8/13. SOIL MECHANICS

**AD-628 510 Fld. 8/13**
**CFSTI PricesMF $1.25**
*UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO MEXICO INSTITUTO DE INGENIERIA*
**ON THE STRENGTH OF CLAYEY SOILS. A STUDY OF THE SHEARING RESISTANCE MECHANISM OF THE STRUCTURAL LEVEL,**
by Daniel Resendiz. Jul 65, 199p. Contract DA-ARO-49-092-64-G41,
Unclassified report

Descriptors: (*Clay, Trafficability), (*Soil mechanics, Clay), Shear stresses, Clay minerals, Failure (Mechanics), Civil engineering, Engineering geology

Contents: The nature of clayey soils; Deformation and strength characteristics; Analysis of phase interaction; Implications of phase interaction; Mechanical consequences of phase interaction; Thixotropy and build up of soil structure; Analysis of soil structure; Mechanics of deformation at the structural level; Components of shear strength; Ultimate strength; A brief discussion on the orientation of slip surfaces; Considerations on the measurement of strength; A failure criterion based on failure mechanism; Field evidence; Laboratory experiments; Critical review and conclusions.

**AD-628 734 Fld. 8/13, 13/6**
**CFSTI PricesMF $1.00**
*ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS*

**CHARACTERISTICS OF U. S. RICE FIELDS AND THEIR EFFECTS ON GROUND MOBILITY.**
Final technical rept.,
by J. G. Kennedy, and E. S. Rush. Dec 65, 118p. Rept. no. TR-3-702,
Contract ARPA Order-400,

Unclassified report

*Availability: Available from U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss., $1.25.*

Descriptors: (*Mobility, Environmental tests), (*Swamps, Trafficability), (*Soil mechanics, Trafficability), Transportation, Military requirements, Test facilities, United States, Armed forces operations, Southeast Asia

The primary objective of this study was to obtain information on the environmental characteristics of rice fields in the United States and the effect of these characteristics on ground mobility for comparison with similar characteristics of rice fields in Southeast Asia as data from the latter become available. Twenty-two study sites were located in rice fields in a variety of soil types and under various cultural practices in Arkansas and Louisiana. Fifteen of the 22 sites were selected for data collection several times during a one-year period (March 1963-March 1964) to determine the seasonal variations in soil moisture, strength, vegetation characteristics, and hydrologic geometry characteristics. Cultural practices and data from the nearest weather stations also were recorded. Profiles and spacing of surface and hydrologic geometry features were measured. General conclusions were: (a) for most U.S. rice fields tested a good correlation exists between soil strength (in terms of rating cone index) and soil-moisture content; (b) estimates of soil strength of rice fields can be made by employing the WES soil moisture -strength prediction method; (c) surface geometry features (dikes) found in U.S. rice fields would not be a significant deterrent to ground vehicles. (Author)

**AD-628 803 Fld. 8/13**
**CFSTI Prices: HC $5.00 MF $1.00**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**INVESTIGATION OF EQUATION OF STATE OF POROUS EARTH MEDIA.**
Final rept., 15 June 64-26 Jul 65,
by G. D. Anderson, G. E. Duvall, J. O. Erkman, G. R. Fowles, and C. P. Peltzer. Feb 66, 177p.
Contract AF 29 (601)-6427, Proj. AF-5710,
SRI-GSU-5059
AFWL TR-65-146

Unclassified report

Descriptors: (*Soil mechanics, Porous materials), Equations of state, Shock waves, Propagation, Test facilities, Nevada, Engineering geology

Earlier experimental work has been extended to evaluate the effect of moisture on the Hugoniot of playa. For engineering applications the Hugoniot of moist playa can be predicted with sufficient accuracy from the Hugoniot of dry playa and water and the assumption of pressure equilibrium. Isentropic release data were obtained for moist and dry playa. The steep release curve (in the P-V plane) from high pressure implies an irreversible phase change. Some low pressure data in the elastic-plastic region are presented. A theoretical discussion of various forms of the Mie-Gruneisen equation and the physical basis of asymptotic statistical models is presented. Shock stability is reviewed. Phase transitions in which delta $V < 0$ are classified according to the signs of the slopes of the coexistence curves. Relative slopes of Hugoniots and isentropes in the mixed phase region are calculated. The results of the theoretical discussion are applied to transitions in bismuth, iron, and quartz. Agreement of values of dP/dT deduced from shock data and measured directly are good for bismuth and poor for quartz and iron. Calculations of spherical shock propagation in a hypothetical medium that undergoes a phase change are presented. The calculations show qualitatively some types of pulse shapes that may be expected in a transforming medium. It is concluded that the proper treatment of phase changes is an outstanding problem in predicting equations of state for earth materials. (Author)

**AD-628 294** **See Fld. 6/6**

**AD-628 848** **See Fld. 6/6**

**AD-628 866** **See Fld. 8/10**

**AD-628 868** **See Fld. 8/10**

## 8/14. TERRESTRIAL MAGNETISM

**AD-628 320 Fld. 8/14, 20/9**
**CFSTI Prices: HC $2.00 MF $0.50**
*QUEEN MARY COLL UNIV OF LONDON (ENGLAND)*
**IDEALISED PROBLEMS CONCERNING THE MOTION OF CYLINDRICAL PLASMA SHEETS IN A MAGNETIC FIELD, WITH APPLICATIONS OF GEOPHYSICAL INTEREST,**
by Angela M. Downs. 1966, 41p. Rept. no. Scientific-5,
Contract AF-EOAR-74-64,
AFCRL 66-6

Unclassified report

Descriptors: (*Terrestrial magnetism, Ionosphere), (*Plasma physics, Ionosphere), Equations of motion, Magnetic storms, Motion, Plasma medium

In a system with radial cylindrical symmetry of cylindrical polar coordinates a cylindrical plasma sheet of infinite electrical conductivity is projected from infinity towards a magnetic field with both axial and toroidal components. An inner, current-bearing plasma sheet, initially in equilibrium, also forms part of the system and influences the motion of the outer plasma sheet. The interaction of the oncoming sheet with this 'ring current' is studied and applications are made to problems of geophysical interest. In particular, the shape of the transient hollow formed in the approaching plasma stream is obtained. A different model, in which the inner, current-bearing sheet is fixed and gives rise to a magnetic field which behaves like that due to a dipole at large distances, is also considered. The effect of the ring current is found to be more pronounced in this case. The hollows obtained are compared with that due to BEARD (1960) and with recent satellite results, and it is suggested that centrifugal effects should be included in computations of the geomagnetic hollow. (Author)

**AD-628 786 Fld. 8/14, 8/7**
**CFSTI Prices: HC $1.60 MF $0.50**
*DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)*
**GEOMAGNETIC FIELD INVERSION (REVERSAL) IN THE LOWER DEVONIAN,**
by A. Ya. Vlasov, and G. V. Kovalenko. Dec 65, 14p. Rept. no. T-430-R,
TT 66-60638

Unclassified report

Trans. of mono. Rock Magnetism and Paleomagnetism, Krasnoiarsk, 1963 p429-45.

Descriptors: (*Terrestrial magnetism, Lithosphere), (*Lithosphere, Terrestrial magnetism), Rock (Geology), Magnetic properties, Geophysics, USSR

**AD-628 787 Fld. 8/14, 8/7**
**CFSTI Prices: HC $1.10 MF $0.50**
*DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)*
**A PROVEN CASE OF GEOMAGNETIC FIELD INVERSION,**
by O. A. Mandrusova, and G. N. Petrova. Dec 65, 9p. Rept. no. T-433-R
TT 66-60639

Unclassified report

Trans. of mono. Rock Magnetism and Paleomagnetism, Krasnoiarsk, 1963 p447-56. See also AD-628 786.

Descriptors: (*Terrestrial magnetism, Lithosphere), (*Lithosphere, Terrestrial magnetism), Rock (Geology), Magnetic properties, Geophysics, USSR

# Field 9-ELECTRONICS AND ELECTRICAL ENGINEERING

## 9/1. COMPONENTS

**AD-628 093 Fld. 9/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*MICTRON INC ALBANY N Y*
**C.W. X-BAND VOLTAGE TUNABLE OSCILLATOR.**
Rept. no. 9 (Final), 1 Jul 63-31 Oct 65,
by M. R. Boyd. 1965, 69p. Contract DA-36-039-AMC-03270 (E) Task DA-1P6-22001-A-055-04,

Unclassified report

See also AD-622 963.

Descriptors: (*Microwave oscillators, X band), (*Magnetrons, X band), Electron tubes, Performance (Engineering), Tuning circuits, Voltage, Theory, Design, Cavity resonators, Electron tube parts

The design objectives for a 10 watt X-Band VTM are discussed and the prior art is reviewed. The general approach is evolved from considerations of the problem of mode stability and coupling. Two basic designs are presented, one interdigital and one consisting of a novel approach with the cavities integral to the vacuum device. Detailed information on the theory of each of the basic designs is given as well as information on the fabrication of the units. Circuit configurations are discussed and a suitable circuit for each of the designs is evolved. A chronological review of all results of operating tubes is given with discussions of important design changes and the reasons for them. Units were developed which exceeded the objective specifications, the most significant performance being 14 watts at 33% efficiency over the 7.0 to 8.0 Gc band. The principal problem area, a lack of consistency in results obtained, is discussed in detail. The composite results are analyzed in terms of the objectives and recommendations are made for further development. (Author)

**AD-628 107 Fld. 9/1**
**CFSTI Prices: HC $68.10 MF $3.00**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**TRANSISTORS AND SEMICONDUCTOR DIODES,**
by K. M. Brezhneva, T. S. Masharova, I. F. Nikolaevskii, D. I. Smetanina, and S. V. Supov. 22 Oct 65, 685p. Rept. no. FTD-TT-65-582,
TT 66-60551

Unclassified report

Unedited rough draft trans. of mono. Tranzistory i Poluprovodnikovye Diody, Miscow, 1963 648p.

Descriptors: (*Transistors, USSR), (*Diodes (Semiconductor), USSR), Electrical properties, Specifications, Operation, Data, Handbooks, Semiconductor devices, Silicon, Germanium

**AD-628 128 Fld. 9/1, 13/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*TEXAS INSTRUMENTS INC DALLAS SEMICONDUCTOR-COMPONENTS DIV*
**PRODUCTION ENGINEERING MEASURE (PEM) FOR TRANSISTOR, PNP, SILICON, SWITCHING TYPE EL-2N (X-12).**
Quarterly rept. no. 2, 25 Jun-25 Sep 65,
by Larry Lands. Nov 65, 46p. Rept. no. TI-03-65-122,
Contract DA-36-039-AMC-06160 (E),
Unclassified report

See also AD-621 873.

Descriptors: (*Transistors, Manufacturing methods), (*Electronic switches, Transistors), Silicon, Resistance (Electrical), Semiconducting films, Epitaxial growth, Gold, Diffusion, Performance (Engineering), Data

Emphasis during this quarter has been placed on material evaluation (h sub FE and h sub fe at 10 mA), switching times, and equipment modification (switching jig). Epitaxial layer thickness and resistivity were optimized and effected a significant reduction in collector saturation voltage. V sub CE (sat) values ranged between 0.33 V and 0.20 V. A reasonable percentage of units attained the 0.25 V maximum specification. If the BV sub CEO requirement is relaxed to 10 V, then the V sub CE (sat) distribution falls within the 0.25 V limit. The reduction in V sub CE (sat) improved h sub FE and / h sub fe/ performance at 10 mA. Optimum device performance still occurs at 1 mA, but fall off is not as drastic. Delay time, rise time, and fall time were reduced on the second engineering samples. This was accomplished by a major reduction in parasitic capacitance associated with the switching fixture. Storage time was increased slightly due to the improved performance of d-c h sub FE. Typical values for the second engineering samples are: t sub d = 3.2 ns; t sub r = 5.2 ns; t sub s = 12.5 ns; t sub f = 6.8 ns. Attempts to improve device gold concentration by liquid nitrogen quenching or increased diffusion temperature failed to produce lower storage times. (Author)

**AD-628 130 Fld. 9/1**
**CFSTI Prices: HC $4.60 MF $0.50**
*RADIO CORP OF AMERICA CAMDEN N J DEFENSE ELECTRONIC PRODUCTS*
**HIGH PERFORMANCE THIN FILMS FOR MICROCIRCUITS (CAPACITORS).**
Quarterly progress rept. no. 2, 1 Jun-31 Aug 65,
by F. Huber, and W. Witt. 30 Sep 65, 48p. Rept. no. CR-65-419-23,
Contract DA-28-043-AMC-01230 (E), Proj. DA-1C0-24401-A-112-04,
Unclassified report

See also AD-623 851.

Descriptors: (*Capacitors, Films), (*Films, Microminiaturization (Electronics)), (*Microminiaturization (Electronics), Circuits), Hafnium, Sputtering, Metal films, Anodic coatings, Capacitance, Dielectric films, Hafnium compounds, Oxides, Thickness, Processing

The deposition rate of hafnium films by cathodic sputtering under the experimental conditions has been determined. For a sputtering time from 0 to 15 minutes an average deposition rate of 330 A/min has been determined. A large number of hafnium/hafnium dioxide/aluminum capacitors were fabricated by wet and plasma anodization processes. Results on capacitance per unit area, dissipation factor, and uniformity are presented. Tests on maximum breakdown strength of hafnium dioxide films have been performed with aluminum and gold as counter electrodes. Preliminary results on the rate of anodization of hafnium dioxide films and on the dielectric constant are presented. A thin film masking technique has been developed utilizing water soluble materials. (Author)

**AD-628 131 Fld. 9/1, 11/8**
**CFSTI Prices: HC $3.00 MF $0.75**
*MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV*
**HIGH POWER VARACTOR FOR UHF TRANSMISSION.**
Final rept., 1 Jul 1964-30 Jun 65,
by George Louis, Paul Heidenreich, and John Cochran. 30 Jun 65, 63p. Contract DA-28-043-AMC-00278 (E) Proj. DA-1P6-2201-A-056,
Unclassified report

See also AD-617 539.

Descriptors: (*Varactor diodes, Ultrahigh frequency), Silicon, Crystals, Epitaxial growth, Doping, Semiconductors, Oxides, Packaging, Manufacturing methods, Processing, Dies, Ultrasonic radiation, Etching, Reliability (Electronics)

The design of power varactors based on charge storage characteristics rather than on conventional capacitance-voltage relationships provides a mechanism for improving power handling and efficiency in frequency multiplication. During the progress of the contract the design of the silicon chip was changed from double-diffused to a passivated, diffused, epitaxial structure which enhanced the power handling and efficiency of the varactor. The package design was also changed from a ceramic-capped stud configuration to a coaxial cartridge, thus reducing parasitic losses and improving power dissipation. Details of the die structure and assembly techniques are given. The electrical characteristics of the device are given in the form of a specification sheet and Appendix I which describes device performance up to 2 gc. (Author)

**AD-628 214 Fld. 9/1**
**CFSTI Prices: HC $2.60 MF $0.50**
*GENERAL ELECTRIC CO AUBURN N Y SEMICONDUCTOR PRODUCTS DEPT*
**RESEARCH AND DEVELOPMENT OF SILICON CONTROLLED RECTIFIERS FOR HIGH FREQUENCY AMPLIFIER APPLICATIONS.**
Quarterly progress rept. no. 5, 16 Oct 65-16 Jan 66,
16 Jan 66, 28p. Contract NObsr-91299, Proj. SR-0080304, Task 9348,
Unclassified report

See also AD-623 903.

Descriptors: (*Silicon controlled rectifiers, High frequency), Amplifiers, Manufacturing methods, Performance (Engineering), Electric currents, Tests

A quantitative analysis of the problem of trade-off between dv/dt and di/dt is presented together with a method for circumventing this limitation. Also included in the report are device fabrication particulars and electrical test data on devices constructed during the quarter. (Author)

**AD-628 225 Fld. 9/1, 13/8**
**CFSTI Prices: HC $23.80 MF $1.25**
*HUGHES AIRCRAFT CO NEWPORT BEACH CALIF*
**THIN FILM MICROCIRCUIT INTERCONNECTIONS.**
Final rept.,
by Bob G. Bender, and Maurice Yang. Oct 65, 242p. Contract DA-28-043-AMC-00052 (E), Proj. DA-1P6-22001-A-057-03,
Unclassified report

See also AD-615 542.

Descriptors: (*Metal films, Electric connectors), (*Electric connectors, Miniaturization (Electronics)), (*Vapor plating, Electric connectors), Manufacturing methods, Disposition, Vacuum apparatus, Circuits, Fixed contacts, Electric currents, Design, Mechanical drawings, Performance (Engineering)

A program of study of deposited thin film interfacial connections and electrical crossovers was completed. Test patterns were designed which permit the study of the interconnection and the crossover with minimal intrusion from contacts and film properties. Processes for the deposition of a variety of materials were developed. Design criteria were established for these materials combinations which are compatible for the purposes of thin film interconnections and crossovers. The use of these criteria can be effective in judging the ability of candidate materials combinations and the ability of each to perform the thin film function. The accuracy of these criteria to perform the task of forecasting the ability of any interconnection or crossover to function in military environments was verified statistically. As a result of the program, all the materials combinations are placed in forced rank according to their relative merits. The reasons for each choice are given. (Author)

**AD-628 230 Fld. 9/1, 13/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV*
**PRODUCTION ENGINEERING MEASURE FOR SILICON OVERLAY TRANSISTORS.**
Quarterly progress rept. no. 3, 1 Jul-30 Sep 65,
by Thomas Kearkuff, and Paul Greer. 30 Sep 65, 32p. Contract DA-36-039-AMC-06156 (E), Proj. DA-74001,
Unclassified report

See also AD-625 317.

Descriptors: (*Transistors, Manufacturing methods), (*Silicon, Transistors), Doping, Gold, Chemical milling, Precision finishing, Processing, Encapsulation, Ultrasonic radiation, Bonding, Wire, Assembling, Reliability (Electronics)

Progress during the reporting period consisted of the following: (1)Diffusion systems. Work was completed on the BBr3 base diffusion system, and system feasibility was determined. The emitter-gold emitter diffusion system was also evaluated for feasibility. (2) Wafer processing. The feasibility of using 1 1/2 inch wafers with slurry polish and chemical etch was investigated. (3) Wafer storage. Devices which had been stored in N2 for 15 days at various steps were processed and evaluated. (4) Assembly processing. Units were constructed using ultrasonic wire bonding of aluminum wire to bare kovar posts and deionized water boiling prior to encapsulation. (5) Reliability. Completed units were evaluated. (Author)

**AD-628 231 Fld. 9/1**
**CFSTI Prices: HC $17.00 MF $1.00**
*LITTON INDUSTRIES SAN CARLOS CALIF ELECTRON TUBE DIV*
**RESEARCH ON NOISE IN CROSSED-FIELD GUNS.**
Final rept. 1 Jul 63-31 Jul 65,
by R. P. Wadhwa. 31 Jul 65, 174p. Contract NObsr-89546,
Unclassified report

See also AD-619 088.

Descriptors: (*Crossed field devices, Electron guns), (*Electron guns, Crossed field devices), (*Noise (Radio), Crossed field devices), Amplifiers, Electron beams, Space charges, Cyclotron waves, Electron optics

The requirements for a low-noise injected-beam crossed-field amplifier are discussed. For low-noise operation it is necessary to select parameters so that the diocotron gain in both the gun and drift regions is minimum. It is shown that this can be achieved in the gun region by a proper choice of the largest possible value of the cathode current density and minimum possible values of the cathode width (in the direction of beam propagation)

and magnetic field. The other requirements for a low-noise operation, are (1) proper gun design to give laminar flow; the short Kino gun seems to be reasonably good for this purpose, (2) elimination and/or attenuation of spurious modes, (3) use of a high-interaction impedance delay line and positioning of the beam close to the circuit.

**AD-628 337 Fld. 9/1, 13/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*GENERAL ELECTRIC CO LYNCHBURG VA COMMUNICATION PRODUCTS DEPT*
**MICROMINIATURE CRYSTAL UNIT TYPE CR-(XM-47) /U PRODUCTION ENGINEERING MEASURE.**
Quarterly progress rept. no. 2, 27 Aug-26 Nov 65, by R. L. Hatcher. 26 Nov 65, 36p. Contract DA-36-039-AMC-06166 (E)
Unclassified report

See also AD-623 320.

Descriptors: (*Crystals, Manufacturing methods), (*Microminiaturization (Electronics), Crystals), High frequency, Mechanical drawings, Specifications, Design, Processing, Quality control

Progress in the second quarter resulted in the shipment of Engineering Sample No. 2 and preparation of facilities and procedures for manufacturing the production units. Manufacturing facilities installation and tooling development is on schedule. The quality control equipment was delivered to this location and will be complete when required for pre-production samples. Manpower requirements were finalized and the personnel needed made available. (Author)

**AD-628 353 Fld. 9/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*RADIO CORP OF AMERICA HARRISON N J ELECTRONIC COMPONENTS AND DEVICES*
**A LOW-NOISE, MULTIPLE-FUNCTION, X-BAND TRAVELING-WAVE TUBE.**
Development rept. no. 12, 1 Jul-30 Sep 65, by M. Milden, and G. Novak. 30 Sep 65, 30p. Contract NObsr-87535, Proj. SR008-03-04, Task 9293,
Unclassified report

See also AD-624 411.

Descriptors: (*Traveling-wave tubes, X-band), (*Microwave amplifiers, X-band), Vidio amplifiers, Wiring diagrams, Electron tube parts, Helixes, Limiters, Design, Ceramic materials, Metals, Multiple operation, Performance (Engineering), Electron guns, Focusing

The objective of the program was to develop a low-noise, multiple-function, traveling-wave tube with three sections (and outputs): (1) a linear, low-noise, X-band amplifier, (2) a limited-output, X-band amplifier, and (3) a videodetector-amplifier section with a substantial voltage output. The program was carried out in two phases. The first, a research and development phase, demonstrated for the first time the practicability of making a single traveling-wave tube that could perform these three functions at the same time. The second phase was devoted to product design. The interim tube contained three sections and three output terminals, as the design was originally conceived. The video output, while present, was below the value sought (1/4 volt vs 1 volt). By mutual consent, the current specification for the tube does not list a video output. The idea of designing the video section of the tube as a beam-actuated solid-state device rather than as a group of dynodes appears to have much promise and deserves investigation.

**AD-628 450 Fld. 9/1, 20/1, 20/12**
**CFSTI Prices: HC $3.00 MF $0.75**
*MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV*
**ACTIVE ACOUSTIC DEVICES.**
Interim rept., 1 Apr-30 Jun 65, by N. G. Sakiotis, W. H. Brendecke, and F. S. Hickernell. Feb 66, 67p. Contract AF 30 (602)-3478, Proj. AF-4519, RADC TR-65-390
Unclassified report

See also AD-620 854.

Descriptors: (*Transducers, Semiconductor devices), (*Acoustic equipment, Semiconductor devices), (*Semiconductor devices, Transducers), Semiconducting films, Piezoelectric crystals, Phenons

Thin film transducer techniques have yielded conversion losses of 6 to 8 db with bandwidths of the order of 50% in the frequency range of 100 to 300 megacycles. Surface roughness and pinholes have caused major interface problems between the transducer and the drift field contacts. The dependence of RF performance upon crystal length and lateral dimensions and the dependence of crystal temperature upon cross section were investigated. The electrical and acoustic parameters which characterize a strong electroacoustic gain interaction are summarized. A correlation between the gain properties of a sample and its etch pit density was determined. (Author)

**AD-628 487 Fld. 9/1, 20/1**
**CFSTI Prices: HC $3.60 MF $0.50**
*NAVAL ORDNANCE LAB WHITE OAK MD*
**SPAR ACOUSTIC SIGNAL AMPLIFICATION SYSTEM,**
by Charles B. Leslie. 4 Jan 66, 31p. Rept. no. NOLTR-65-238, Task RUTO-3E-000/F108-02-09,
Unclassified report

Descriptors: (*Hydrophones, Amplifiers), (*Amplifiers, Hydrophones), Acoustics, Signals, Design, Wiring diagrams, Performance (Engineering)

The report describes the design philosophy, circuit diagrams and test results of the acoustic signal amplification system for the SPAR vehicle. Any of 15 hydrophones may be connected to any of 6 amplification channels. Each channel has a special ground loop hum rejection system, a precision attenuator of up to 60 db, and a total of 40 db of well stabilized gain following the hydrophone. (Author)

**AD-628 488 Fld. 9/1, 20/1**
**CFSTI Prices: HC $2.60 MF $0.50**
*NAVAL ORDNANCE LAB WHITE OAK MD*
**THE SPAR HYDROPHONES,**
by Charles B. Leslie. 29 Dec 65, 28p. Rept. no. NOLTR-65-236, Task RUTO-3E-000/F108-02-09,
Unclassified report

Descriptors: (*Hydrophones, Design), Calibration, Electroacoustic transducers, Ceramic materials, Preamplifiers, Wiring diagrams, Performance (Engineering), Acoustics

Twenty hydrophones were procured for the SPAR research platform to cover the range from 100 cps to 10 kc with a nominal ceramic sensitivity of -81 db re 1 volt/microbar and a preamplifier gain of 21 db. The hydrophones are described in detail, along with calibration results for sensitivity, frequency response, directivity, relative phase, and self noise level. (Author)

**AD-628 517 Fld. 9/1**
**CFSTI Prices: HC $14.60 MF $1.00**
*VALPEY FISHER CORP HOLLISTON MASS*
**QUARTZ CRYSTAL UNIT CR- (XM-37)/U. COMPLETION REPORT STEP I.**
Process manual,
by Norman R. Gillin. 1965, 141p. Contract DA-36-039-sc-85972,
Unclassified report

Descriptors: (*Quartz resonators, Manufacturing methods), Production control, Crystal holders, Specifications, Quality control, Military requirements, Very high frequency

The report consists of four sections. Problems encountered during fabrication of CR- (XM-37)/U in the frequency range 150 mc to 200 mc are discussed in Section I. Yield figures based on Preproduction and Pilot Run are shown. Section II contains test data during various stages of development. Also illustrated are mounting details and tabulation of holder resistance, inductance and capacitance. Processing is detailed in Section III. The Quality Control and Inspection Plan is contained in Section IV. (Author)

**AD-628 535 Fld. 9/1, 9/2, 9/5**
**CFSTI Prices: HC $3.00 MF $0.75**
*NAVAL AVIONICS FACILITY INDIANAPOLIS IND*
**THE COMPUTER ORIENTED DESIGN OF ELECTRONIC DEVICES. (CODED). PROJECT--REVISED PROGRAM FOR POWER TRANSFORMERS.**
Technical rept.,
by John A. Ottlinger, and John P. Staples. 20 Jan 66, 63p. Rept. no. NAFI-TR-774,
Unclassified report

Descriptors: (*Electronic equipment, Design), (*Power transformers, Design), (*Programming (Computers), Design), Standardization, Microminiaturization (Electronics)

This report explains the purpose, background, and applications of the Computer Oriented Design of Electronic Devices program (CODED) for avionic power transformers. It also describes the purpose, need, and techniques of the transformer component standardization effort. The report is intended to acquaint the reader with the CODED project and provide enough information so that a transformer designer may use the program successfully. It is also intended to illustrate the benefits of using digital methods as a tool in the solution of engineering design problems. (Author)

**AD-628 577 Fld. 9/1, 13/8**
**CFSTI Prices: HC $6.60 MF $0.75**
*BENDIX RADIO DIV BENDIX CORP BALTIMORE MD*
**THIN FILM MICROCIRCUIT INTERCONNECTIONS.**
Quarterly rept. no. 1, 1 Jul-30 Sep 65, by H. M. Greenhouse, J. F. Bass, I. G. Goldsmith, T. H. Yaffe, and W. W. Richardson. Feb 66, 67p. Contract DA-28-043-AMC-01482 (E), Proj. DA-1P6-22001-A-057, Task DA-03, ECOM 01482-1
Unclassified report

Descriptors: (*Microminiaturization (Electronics), Electric connectors), (*Electric connectors, Metal films), (*Metal films, Electric connectors), Disposition, Chromium, Gold, Aluminum, Processing, Circuits, Electric insulation, Performance (Engineering), Test methods, Resistance (Electrical), Voltage, Reliability (Electronics)

Two patterns for interfacial interconnections and one pattern for the electrically insulating crossovers were designed. Masks were fabricated for these patterns which make possible, in a single deposition sequence, the fabrication of 440 interfacial interconnections or 1512 insulating crossovers. Processing specifications for the deposition of chromium-gold, chromium, and aluminum were established. A measurement technique and procedure were devised and proven for the accurate measurement of small D. C. voltages. Interfacial interconnections of the combinations chromium over chromium-gold, chromium-gold over chromium, chromium-gold over chromium-gold, alumi-

num over chromium-gold, and aluminum over chromium, were fabricated, tested, and evaluated. A qualitative estimate of the interfacial resistance corresponding to these conductor combinations was made. Preliminary adhesion tests were performed. (Author)

**AD-628 618 Fld. 9/1, 13/8**
**CFSTI Prices: HC $7.60 MF $0.75**
*PHILCO CORP LANSDALE PA*
**RESEARCH AND DEVELOPMENT LOW COST INTEGRATED CIRCUIT TECHNIQUES.**
Quarterly progress rept. no. 1, 15 Jun-14 Sep 65, by S. Wagner, and M. Walker. 14 Sep 65, 72p.
Rept. no. Philco R-506,
Contract DA-28-043-AMC-01424 (E), Proj. DA-1P6-22001-A-056-0225,
Unclassified report

Descriptors: (*Integrated circuits, Manufacturing methods), (*Encapsulation, Integrated circuits), (*Electric connectors, Integrated circuits), Electric wire, Bonding, Semiconductor devices, Glass, Coatings, Deposition, Evaporation, Vapor plating, Processing, Assembling, Packaging, Hermetic seals, Printed circuits

The use of an adherent impervious coating for encapsulating silicon integrated circuits, combined with a batch mounting and interconnection technique, will result in (1) decreased cost as a result of package elimination; (2) increased packing density; (3) improved reliability due to reduction in the number of contacts and elimination of Au-Al thermocompression bonds. This report describes a technique for selective deposition of 1 to 2 micron thick glass on silicon integrated circuits and attaching these circuits to a printed circuit board by means of 'flip chip' mounting. Glass has been deposited by means of evaporation and pyrolytic vapor plating. Evaporation appears to have some advantages. Evaluation of two high temperature metalization systems (Ti-Ag-Ti and Cr-Ag-Cr) has indicated satisfactory properties. A test model employing these techniques has been designed for environmental testing and technique evaluation. (Author)

**AD-628 635 Fld. 9/1, 20/14**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**CAVITY RESONANCES IN ACCELERATED SYSTEMS.**
Physical sciences research papers,
by E. J. Post, and Asim Yildiz. 24 Mar 65, 9p.
Rept. no. AFCRL-PSRP-163,AFCRL-65-827
Proj. AF-5635, Task 563501,
Unclassified report

Prepared in cooperation with Raytheon Co., Wayland, Mass.

*Availability: Published in Physical Review Letters, v15 n5 p177-8 Aug 2 1965. Copies to DDC users only.*

Descriptors: (*Cavity resonators, Rotation), (*Wave transmission, Cavity resonators), Acceleration

For a cylindrical cavity it is feasible to consider a physical situation where medium and cavity rotate at different angular velocities. It is therefore necessary to impose as a logical requirement that the theory is capable of dealing with any of these situations without further special assumptions. To do this it seems necessary to consider the transformation of the medium part separately from the freespace part of the constitutive equations. (Author)

**AD-628 682 Fld. 9/1, 20/14**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL APPLIED SCIENCE LAB BROOKLYN N Y*
**PHASE STABILITY OF TYPICAL NAVY RADIO FREQUENCY COAXIAL CABLES,**
by G. Rodriguez. 1965, 17p.
Unclassified report

Prepared for presentation at the Annual Symposium on Technical Progress in Communication Wire and Cable (14th), 1 December 1965, Shelburne Hotel, Atlantic City, New Jersey.

Descriptors: (*Coaxial cables, Radiofrequency), (*Phase distortion, Coaxial cables), Naval equipment, Transmission lines, Dielectrics, Polyethylene plastics, Styrene plastics, Electrical properties

Many of the present military installations utilize highly phase-sensitive electronic systems, of which radio frequency coaxial cables are essential components. It follows that the change in electrical length (the physical length of an air line of equal delay) of the transmission line is an important factor in the coaxial cable design. In phase-sensitive systems temperature variations, bending and flexing, frequency, vibrations, mechanical tension, humidity and equality of physical length are contributing factors affecting phase stability. This paper is mainly concerned with braided coaxial cables and the only factor considered is the variation of electrical length with temperature. Phase stability is defined in this paper as the ability of a cable to maintain a constant velocity of phase propagation throughout a temperature range. (Author)

**AD-628 691 Fld. 9/1, 18/8**
**CFSTI Prices: HC $3.00 MF $0.75**
*BELL TELEPHONE LABS INC NEW YORK*
**A SUMMARY OF SURFACE EFFECTS OF RADIATION ON SEMICONDUCTOR DEVICES,**
by J. P. Mitchell, and D. K. Wilson. 1 Dec 65, 79p. Rept. no. Scientific-1,
Contract AF 19 (628)-4157, Proj. AF-4608 Task 460801,
AFCRL 65-898
Unclassified report

Prepared in cooperation with Western Electric, Inc., New York.

Descriptors: (*Semiconductor devices, Radiation damage), (*Radiation damage, Semiconductor devices), Surface properties, Transistors, Degradation, Diodes (Semiconductor), Surfaces, Electrical properties

A brief review of surface physics is given as background for the subsequent discussion on the role of surfaces in the behavior of semiconductor devices. The effects of channels and surface generation-recombination on p-n junctions and transistor characteristics are discussed. The observed effects of ionizing radiation on nonpassivated, gas-filled transistors are interpreted in terms of a model in which ions formed in the gas ambient deposit charge on the device surface. The resultant surface charge buildup creates channels on the device surface which cause a decrease in h sub FE and increase in I sub CBO. Saturation, recovery, and the effects of dose rate and bias are also discussed. Degradation of planar passivated transistors and other devices employing SiO2 layers due to radiation is similar to that observed for nonpassivated devices. Surface charge buildup affects the device surface and leads to degradation. The bulk of experimental evidence points to accumulation of positive charge at the SiO2-Si interface as the cause of degradation. Several possible means of charge buildup at the interface are discussed. However, the process responsible has not, as yet, been identified. The direction of future experiments is discussed, particularly of those experiments which may yield information about the part played by radiation in positive charge accumulation at the SiO2-Si interface. (Author)

**AD-628 712 Fld. 9/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*RADIO CORP OF AMERICA SOMERVILLE N J ELECTRONIC COMPONENTS AND DEVICES*
**STRUCTURES FOR 300-WATT, 400MHZ UHF POWER TRANSMISSION.**
Interim technical rept. no. 1, 1 Oct-31 Dec 65, by F. Katnack, and R. Minton. Jan 66, 50p.
Contract AF 33 (615)-3202,
Unclassified report

Descriptors: (*Transistors, Radiofrequency), Capacitance, Voltage, Ultrahigh frequency, Radiofrequency power, Performance (Engineering)

The effect of collector capacitance, both voltage fixed and voltage variable, on the performance of RF transistors is discussed. Two methods for reducing this capacitance are described; (1) the use of integral leads to reduce the fixed bonding pad capacitance and (2) N (+) conductance plugs to reduce depletion layer capacitance by permitting the use of higher resistivity starting material Data are given on the performance of paralleled transistors in a cavity structure, and the problems associated with paralleling of transistors are considered. Power output measurements are given on low and medium power RF transistors connected in a Darlington configuration. The necessary circuit modifications are discussed. (Author)

**AD-628 732 Fld. 9/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*MICHIGAN UNIV ANN ARBOR ELECTRON PHYSICS LAB*
**INVESTIGATION OF LARGE-SIGNAL KLYSTRON AND TRAVELING-WAVE DEVICES.**
Quarterly progress rept. no. 3, 1 Mar-31 May 65, by G. T. Konrad, and J. E. Rowe. Jan 66, 65p.
Contract AF 30 (602)-3569, Proj. AF-5573,ORA-06847 Task 557303,
RADC TR-65-280
Unclassified report

See also AD-618 916.

Descriptors: (*Klystrons, Performance (Engineering)), (*Traveling-wave tubes, Performance (Engineering)), Microwave amplifiers, Magnetrons, Electron beams, Focusing, Electron guns, Ultrahigh frequency, Microwave equipment

A general nonlinear multi-dimensional interaction theory is employed to analyze Brillouin focused beams in klystrons and traveling-wave amplifiers. Harmonic currents and beam spread are found for a number of different situations. Closed-form solutions are being sought for the nonlinear equations. Beam stability in the presence of r-f and velocity distribution effects on the start-oscillation conditions of BWO's are two specific problems where these solutions are to be applied. Experimental programs to check these analyses are described. An appropriate taper on a ring-and-bar circuit for obtaining phase-focused operation is presented. Progress on the magnetron injection gun computer program is described. The trajectory starting problem appears to be solved, while further work on establishing the proper current density from the cathode is indicated. Provisions in the relativistic electron beam computer program for self-induced effects are also described. The status of the UHF helix-magnetron injection gun device is summarized. Performance data of the gun in a beam analyzer is presented. (Author)

**AD-628 046 See Fld. 20/5**

**AD-628 089 See Fld. 7/4**

**AD-628 110 See Fld. 9/5**

**AD-628 113 See Fld. 9/5**

**AD-628 114 See Fld. 20/3**

**AD-628 133 See Fld. 20/6**

**AD-628 170 See Fld. 13/8**

**AD-628 324 See Fld. 9/5**

**AD-628 355 See Fld. 20/6**

**AD-628 500 See Fld. 9/5**

**AD-628 502 See Fld. 9/5**

**AD-628 537 See Fld. 11/9**

**AD-628 664 See Fld. 13/8**

**AD-628 670 See Fld. 9/5**

**AD-628 770 See Fld. 20/12**

**AD-628 773 See Fld. 20/14**

## 9/2. COMPUTERS

**AD-628 135 Fld. 9/2**
**CFSTI Prices: HC $5.00 MF $1.25**
*TRW SYSTEMS REDONDO BEACH CALIF*
**ON LINE COMPUTER SYMBOLIC MANIPULATION.**
Final rept. Aug 64-Aug 65,
by Frederick W. Blackwell. Jan 66, 199p. Rept. no. 5253-6001-RU000,
Contract AF 30(602)-3516, Proj. AF-4594 Task 459404,
RADC TR-65-376

Unclassified report

Descriptors: (*Programming (Computers), Programming languages), (*Programming languages, Digital computers), Compilers, Data processing systems, Algebra

The development is described of an on-line computer system for symbol manipulation in which a user can arbitrarily define symbols and rules for operating with these symbols, and then instruct the computer on-line to selectively apply the rules. At the basis of the system is a small set of elementary symbol manipulation operators which can be programmed on-line to carry out more complex symbolic processes. The application of the system to algebra is presented; the resultant system for algebraic symbol manipulation allows the user to have the computer apply rules of algebra on-line to transform mathematical expressions which he has input in a natural form. (Author)

**AD-628 169 Fld. 9/2, 12/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING*
**CANONICAL AND MINIMAL FORMS FOR NAND AND NOR LOGIC,**
by M. A. Marin, and M. A. Melkanoff. Dec 65, 26p. Rept. no. Rept. no. 65-57,
Contract Nonr-233 (52),AT (11-1)-GEN-10 Proj. 14,

Unclassified report

Descriptors: (*Computer logic, Special functions (Mathematical)), Mathematical logic, Switching circuits, Mapping (Transformations)

A method is described for deriving 2-level canonical expressions for NAND and for NOR logic using complemented and uncomplemented variables. Both expressions may be obtained directly from the truth table of the given Boolean function. It is also proven that the Quine-McCluskey minimization technique can be extended to minimize the proposed 2-level canonical expressions. (Author)

**AD-628 203 Fld. 9/2, 5/7**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**A NOTE ON PUSHDOWN STORE AUTOMATA AND REGULAR SYSTEMS.**
Scientific rept.,
by Sheila A. Greibach. 31 Aug 65, 17p. Rept. no. Scientific-2,SDC-TM-738/016/00
Contract AF 19(628)-5166, Proj. AF-5632 Task 563205,
AFCRL 65-861

Unclassified report

Prepared in cooperation with Harvard Univ., Cambridge, Mass.

Descriptors: (*Computer storage devices, Programming languages), (*Programming languages, Context free grammars), Automata, Set theory, Compilers

A theorem of Bar-Hillel, Perles, and Shamir is used to show that the set of tapes left on the pushdown store by a regular set is regular. As a consequence, one obtains a generalization of a theorem of Buchi. (Author)

**AD-628 204 Fld. 9/2, 5/7**
**CFSTI Prices: HC $2.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**FINITE-TURN PUSHDOWN AUTOMATA.**
Scientific rept.,
by Seymour Ginsburg, and Edwin H. Spanier. 1 Nov 65, 44p. Rept. no. Scientific-5,SDC-TM-738/020/00
Contract AF 19(628)-5166, Proj. AF-5632 Task 563205,
AFCRL 65-903

Unclassified report

Prepared in cooperation with California Univ., Berkeley.

Descriptors: (*Computer storage devices, Programming languages), (*Programming languages, Context free grammars), Automata, Compilers

A finite-turn pda is a pda in which the length of the pushdown tape alternatively increases and decreases at most a fixed bounded number of times during any sweep of the automation. This paper is a study of these finite-turn pda and the context free languages they recognize. These context free languages are characterized both in terms of grammars (two ways) and in terms of generation from finite sets by three operations. A decision procedure is given for determining if an arbitrary pda is a finite-turn pda. There is no decision procedure for determining if an arbitrary context free language is accepted by some finite-turn pda. (Author)

**AD-628 205 Fld. 9/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**STACK AUTOMATA AND COMPILING.**
Technical memo.,
by Seymour Ginsburg, Sheila A. Greibach, and Michael A. Harrison. 17 Nov 65, 65p. Rept. no. TM-738/021/00,Scientific-6
Contract AF 19(628)-5166, Proj. AF-5632 Task 563205,
AFCRL 65-918

Unclassified report

Descriptors: (*Compilers, Automata), Mathematical models, Computer storage devices, Programming languages, Context sensitive grammars, Pattern recognition, Machine translation

Compilation consists of two parts, recognition and translation. A mathematical model is presented which embodies the salient features of many modern compiling techniques. The model, called the stack automaton, has the desirable feature of being deterministic in nature. This deterministic device is generalized to a nondeterministic device (nondeterministic stack automaton) and particular instances of this more general device noted. Sets accepted by nondeterministic stack automata are recursive. Each set accepted by a deterministic linear bounded automaton is accepted by some nonerasing stack automaton. Each context sensitive language is accepted by some (deterministic) stack automaton. (Author)

**AD-628 212 Fld. 9/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**NUMBERED-LINE SYNTACTIC DESCRIPTION OF JOVIAL (J3),**
Professional paper,
by Millard H. Perstein. 1 Jan 66, 14p. Rept. no. SP-2311/000/00,

Unclassified report

Descriptors: (*Programming languages, Syntax), (*Syntax, Programming languages), Computational linguistics

This is an unofficial syntactic description of J3. Most of the syntactic definitions leading to definition of a program are given a numeric reference. A few oft-cited definitions are given references consisting of Greek letters or special symbols. The definitions are also named, but the names only provide the reader with semantic cues. The names do not occur within definitions. All citations are in terms of the numeric, Greek-letter, or special-symbol references. (Author)

**AD-628 220 Fld. 9/2, 12/2**
**CFSTI Prices: HC $7.25 MF $2.00**
*CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING*
**THE AUTOMATIC ASSIGNMENT AND SEQUENCING OF COMPUTATIONS ON PARALLEL PROCESSOR SYSTEMS,**
by David F. Martin. Jan 66, 425p. Rept. no. 66-4,
Contract AT (11-1)-GEN-10,Nonr-233 (52) Proj. 14,

Unclassified report

Descriptors: (*Operations research, Data processing systems), (*Scheduling, Mathematical programming), (*Mathematical programming, Scheduling), Programming (Computers)

The problem of optimal a priori assignment and sequencing of computations on parallel processor systems is investigated. The problem is formulated as a mathematical program in which it is desired to minimize a defined expected cost of computation subject to (1) maintaining partial orderings between computations; (2) a feasible computation-processor correspondence; (3) system inventory constraints. The method of solution is one of successive approximation, consisting of a systematic perturbation of an initial feasible assignment and sequence, accepting or rejecting trial solutions to achieve monotonic cost reduction. Since only a limited portion of the solution space is explored, the solution is generally suboptimal. The partially-ordered set of computations is represented by a cyclic directed graph, the characterization of which requires a priori estimates of arc traversal (branching) probabilities, the expected number of times each cycle will be traversed, and the mean execution times of each computation. Each processor is characterized by an operation list and a mean execution time vector. Analytical contributions in this study include computationally efficient algorithms for vertex computational probabilities and approximate mean path length on acyclic directed graphs, and the formal transformation of a restricted class of cyclic directed graphs into temporally-equivalent acyclic graphs.

**AD-628 319 Fld. 9/2, 12/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER*
**THEOREM-PROVING BY COMPUTER.**
Final rept. for 1 Jan-31 Dec 65,
by B. Kallick. 5 Jan 66, 36p. Rept. no. IITRI-H6015-1,

Contract AF 49 (638)-1458, Proj. AF-9769, IITRI-H6015
AFOSR 66-0181
Unclassified report

See also AD-611 815.

Descriptors: (*Theorems, Algorithms), (*Mathematical logic, Theorems), (*Computers, Algorithms), Decision theory, Number theory, Artificial intelligence

The subject of this study is the development of efficient theorem-proving algorithms, amenable to computer implementation, through the application of the theory of mathematical logic. The approach taken is via the Herbrand theorem and consists in expressing the denial of the theorem as a prefix formula of predicate calculus and generating an inconsistent set of instances of this formula. Several such refutation procedures are described and shown to be capable of deciding the satisfiability of various classes of formulas. (Author)

**AD-628 335 Fld. 9/2, 12/2**
**CFSTI Prices: HC $10.60 MF $0.75**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**KINGSTON FORTRAN II LIBRARY SUBPROGRAMS AS SIMULATION AIDS.**
Master's thesis,
by Richard Henry Kauffman. Dec 65, 103p.
Rept. no. GRE/MATH/65-6,
Unclassified report

Descriptors: (*Programming languages, Compilers), (*Compilers, Simulation), Mathematical models, Programming (Computers)

This thesis developed six Kingston Fortran II library subprograms for reducing the amount of time required to program mathematical simulations with the IBM 1620. Detailed operating instructions are given for the following subprograms: Lehmer Random Number Generator, Process Point Simulations, Statistical evaluations, Integration (Simpson's Rule), Binomial coefficient and the evaluation of the cumulative normal distributions. The thesis also describes, in detail, the operating instructions of a method developed for batch execution of Kingston Fortran II for the IBM 1620. (Author)

**AD-628 496 Fld. 9/2, 7/4, 11/9**
**CFSTI Prices: HC $3.00 MF $0.75**
*MASSACHUSETTS UNIV AMHERST POLYMER RESEARCH INST*
**X-RAY DIFFRACTION COMPUTER PROGRAMS FOR THE CDC 3600 AND THE IBM 7094.**
Technical rept.,
by C. R. Desper. 1 Oct 65, 69p. Rept. no. ONR TR-80,
Contract Nonr-3357 (01), Proj. NR-056-378,
Unclassified report

See also AD-420 278.

Descriptors: (*Programming (Computer), X-ray diffraction analysis), (*X-ray diffraction analysis, Programming (Computer)), Polymers, Crystallization, Digital computers

Six new computer programs have been written to process the x-ray diffraction data obtained at this laboratory. Of these, four programs are for use with the Control Data Corporation 3600 computer, and two are for use with the IBM 7094 at the M.I.T. Computation Center. The CDC 3600 programs are: BIAXSCAN, for processing raw pole figure data from our automatic x-ray diffractometer; SHORTBX, an abbreviated version of BIAXSCAN suited for studies of uniaxial orientation; RADLSCAN, for processing raw radial scan data; and RESOLVER, for resolution of overlapping x-ray peaks. The two IBM 7094 programs are used for graphical plotting of the pole figure contour maps from data provided by BIAXSCAN: one uses the Calcomp plotter, while the other utilizes the cathode-ray-tube output. (Author)

**AD-628 507 Fld. 9/2**
**CFSTI Prices: HC $41.20 MF $2.00**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**INSTRUCTION SYSTEM AND PROGRAMMING FOR THE BESM-2,**
by V. L. Bazilevich, and L. V. Bazilevich. 24 Sep 65, 416p. Rept. no. FTD-TT-65-111, TT 66-60622
Unclassified report

Unedited rough draft trans. of mono. Sistema Komand i Programmirovanie dyla BESM-2, Leningrad, 1964 342p.

Descriptors: (*Digital computers, USSR), Instruction manuals, Programming (Computers)

The book presents the fundamentals of practical programming for the most common large domestic electronic computer, the BESM-2. The arrangement of the machine and the method of executing instructions are described to the degree required by the programmer. The number systems employed in programming are given, together with various examples of the employment of instructions and operations in program writing. The procedure used in solving problems on the BESM-2 is indicated. The book may be used as a text in training programmers for the BESM-2, and will prove useful to a wide group of readers interested in electronic computers or working in this field. (Author)

**AD-628 611 Fld. 9/2, 8/6**
**CFSTI Prices: HC $4.60 MF $0.50**
*NORTHWESTERN UNIV EVANSTON ILL DEPT OF GEOGRAPHY*
**HAGER III AND HAGER IV: TWO MONTE CARLO COMPUTER PROGRAMS FOR THE STUDY OF SPATIAL DIFFUSION PROBLEMS.**
Technical rept.,
by Forrest R. Pitts. Oct 65, 47p. Rept. no. TR-4,
Contract Nonr-1228 (33), Proj. NR-389-140,
Unclassified report

Descriptors: (*Programming (Computers), Monte Carlo method), (*Diffusion, Monte Carlo method), Geography, Simulation

Two computer programs, HAGER III and HAGER IV, for Hagerstrand's models replicating the spatial diffusion of innovations, are presented. A sample run accompanies each program, based upon Hagerstrand's original Asby (Sweden) data. An iterative analytic solution (routine Omega) for the Hagerstrand models is incorporated in the computer programs. The programs permit a maximum of flexibility in input formats and output choices. Multiple runs are possible, and different data sets may follow one another. The programs are written in CDC 3400 Fortran, for a 32K machine. (Author)

**AD-628 749 Fld. 9/2, 15/7**
**CFSTI Prices: HC $22.30 MF $1.25**
*COMPUTER CONCEPTS INC SILVER SPRING MD*
**STUDY OF COMPUTERS TO IMPROVE COMMAND POST EXERCISES.**
Final technical rept., 1964-65,
by Lewis E. Casner, Michael A. Wieder, Robert M. Littrell, and Robert M. Thompson. 19 Nov 65, 214p. Contract N61339-1439, NAVTRADEVCEN 439-2
Unclassified report

Descriptors: (*Computers, Simulation), (*Mathematical models, Warfare), (*Game theory, Warfare), Training devices, Operations research, Military tactics

This report documents the findings of a study of the use of computers to simulate combat conditions for conducting Command Post Exercises (CPX) and similar tactical training exercises. It was conducted under the auspices of the Army Participation Group, U.S. Naval Training Device Center. The study included detailed analyses of Army tactical training requirements, related war gaming models and techniques, and the applicability of available computer systems. It resulted in the proposed design of a computer-assisted CPX Simulator consisting of the following elements: (1) a permanent administrative organization; (2) a central computer installation and exercise site; (3) a mobile communications system for conducting exercises at remote player sites via teletype communication with the central site; (4) computer models for simulating combat units and functions at the divisionbrigade-battalion levels. The concept was tested using the CENTAUR gaming model developed by the Army Strategy and Tactics Analysis Group (STAG) and the facilities of that organization. It was found to be a feasible approach to improving Army tactical training. Major areas of improvement were the economy, scope, and realism of the exercise. Under the concept of the CPX Simulator, field commanders and their staffs at the division level and below will be exercised in all aspects of modern warfare under computer-simulated combat conditions. (Author)

**AD-628 776 Fld. 9/2, 5/2, 5/9, 12/2**
**CFSTI Prices: HC $5.00 MF $1.00**
*SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF*
**RESEARCH AND TECHNOLOGY DIVISION REPORT FOR 1965.**
Technical memo.,
by D. L. Drukey, K. W. Yarnold, J. I. Schwartz, and G. M. Dobbs. Jan 66, 178p. Rept. no. TM-530/009/00,
Contract AF 19 (628)-3418 ,Nonr-4421 (00)
Unclassified report

Descriptors: (*Data processing systems, Scientific research), (*Programming (Computers), Operations research), Education, Training, Mathematics, Decision making, Information retrieval

The document describes the work of SDC's Research and Technology Division for 1965. The progress of the various studies and activities in the Division is described under the following major headings: Advanced Programming, Information Processing Research, Programming Systems, Data Base Systems, Language Processing and Retrieval, Decision Processes, Education and Training, Mathematics and Operations Research, Research and Technology Laboratory, and Computer Center Department. In addition, the report contains descriptions of Division-sponsored books, meetings and colloquia, and professional activities of the staff. (Author)

**AD-628 780 Fld. 9/2**
**CFSTI Prices: HC $16.10 MF $1.00**
*INSTRUMENTATION RESEARCH LAB STANFORD UNIV PALO ALTO CALIF*
**AN OPERATING SYSTEM FOR THE LINC COMPUTER.**
Technical rept.,
by Richard Kelly Moore. 1 Nov 65, 165p. Rept. no. IRL-1038,
Contract AF 49 (638)-1599,NsG-81-60 Proj. AF-9777, Task 977701,
AFOSR 0325
Unclassified report

Descriptors: (*Digital computers, Operation), Compilers, Data storage systems, Programming (Computers)

This report describes an extensive software system for the LINC computer. The system includes a symbolic program assembler, an Algol-58 compiler (which runs on an IBM 7090), a data-filing

system, and various displaying and typing programs, including a general text editor. Utilization of all system features is described, with the aid of many examples, and annotated program listings of the system are included. The system is of interest both as an example of LINC utilization and as a study in the programming of small computers with aid of large computers. (Author)

**AD-628 819 Fld. 9/2, 17/9**
**CFSTI Prices: HC $1.60 MF $0.50**
*INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA RESEARCH AND ENGINEERING SUPPORT DIV*
**DIGITAL SIMULATION OF NOISE IN ANALOGUE SYSTEMS.**
Research paper,
by F. A. Albini. Dec 65, 14p. Rept. no. RP-P-228 ,IDA/HQ65-4384

Unclassified report

Descriptors: (*Digital computers, Simulation), (*Analog systems, Noise (Radar)), Statistical analysis, Statistical functions, Radar tracking

This note presents a procedure for estimating the power spectral density equivalent to that for the nonstationary process of sampling at a fixed rate from a population described by zero mean and known standard deviation, typical of digital computer simulation of noise in analogue systems. The stationary equivalent to the process is generated by forming a super-ensemble with random time origin and taking the expected value in time of the nonstationary correlation function. Examples are presented for three often-used digital noise-generation techniques. (Author)

**AD-628 827 Fld. 9/2**
*ITT FEDERAL LABS NUTLEY N J*
**A 'REGION' CONCEPT AND ITS APPLICATION TO THRESHOLD LOGIC,**
by Philip Kaszerman. 16 Dec 64, 23p. Contract AF-AFOSR-62-152,AF-AFOSR-24-63 Proj. AF-9769, Task 976902,
AFOSR 65-2684

Unclassified report

*Availability: Published in Information and Control v8 n5 p531-51 Oct 1965. Copies to DDC users only.*

Descriptors: (*Computer logic, Special functions (Mathematical)), Synthesis, Mathematical logic

The concept of a 'region of vertices' is introduced and precisely defined. Boundary, interior, and exterior vertices are defined. It is proved that a necessary and sufficient condition that a Boolean function be a threshold function is that the boundary TRUE vertices be separable from the boundary FALSE vertices. This leads to a simpler characterization of a threshold function than the original defining inequalities. The functions that are generated by a two-threshold device network are examined for the properties in terms of regions of TRUE and FALSE vertices. By making use of these properties, synthesis procedures are developed. (Author)

**AD-628 863 Fld. 9/2**
**CFSTI Prices: HC $5.00 MF $1.25**
*NORTRONICS NEWBURY PARK CALIF APPLIED RESEARCH DEPT*
**DEVELOPMENT OF AN AUTOMATIC DEVICE FOR SOLVING CONTINUUM MECHANICS PROBLEMS.**
Technical rept., 1 Jul 64-30 Jun 65,
by John G. Trulio, Leo A. Riley, and Sterling H. Wilson,Jr.. Feb 66, 197p. Rept. no. NARD-65-8-R,
Contract AF 29 (601)-6503, Proj. AF-5710,A-81
AFWL TR-65-165

Unclassified report

Descriptors: (*Continuum mechanics, Special purpose computers), (*Special purpose computers, Feasibility studies), Design

The limiting factor in solving continuum mechanics problems by theoretical means lies in the speed of available computing equipment. This equipment is almost exclusively of the general-purpose variety. It is intended not merely for the solution of the problems of continuum mechanics but for such diverse uses as the preparation of payrolls, cost accounting and the solution of the equations of nuclear field theory. A feasibility study was performed to produce designs for computers which solve the equations of continuum mechanics in a highly efficient manner, to determine quantitatively what increases in the speed of solution are possible, and to arrive at hardware costs of the resulting special-purpose computers. The results indicate increases in speed of at least a factor of 20 for one-dimensional motion as compared with the fastest general-purpose digital computer available today, at a quarter of its cost. At least as favorable speed ratios hold in two and three space dimensions, although the cost in two dimensions is about equal, and in three dimensions is about four times greater for the special-purpose computer. (Author)

**AD-628 110** **See Fld. 9/5**

**AD-628 213** **See Fld. 5/3**

**AD-628 405** **See Fld. 5/4**

**AD-628 494** **See Fld. 5/8**

**AD-628 535** **See Fld. 9/1**

**AD-628 543** **See Fld. 20/4**

**AD-628 612** **See Fld. 8/2**

**AD-628 670** **See Fld. 9/5**

## 9/3. ELECTRONIC AND ELECTRICAL ENGINEERNG

**AD-628 112** **See Fld. 12/2**

**AD-628 280** **See Fld. 14/2**

**AD-628 415** **See Fld. 14/2**

**AD-628 485** **See Fld. 14/5**

**AD-628 486** **See Fld. 9/5**

**AD-628 701** **See Fld. 5/9**

**AD-628 864** **See Fld. 5/1**

## 9/4. INFORMATION THEORY

**AD-628 546 Fld. 9/4, 20/3**
**CFSTI Prices: HC $3.00 MF $0.75**
*DELAWARE UNIV NEWARK DEPT OF ELECTRICAL ENGINEERING*
**COMMUNICATION CHARACTERISTICS OF PHOTOELECTRIC DETECTION.**
Technical rept.,
by Joseph Hamilton Deal,Jr.. Jun 64, 68p. Rept. no. TR-Q41,
Contract AF-AFOSR-2-63,
AFOSR 65-0027

Unclassified report

Master's thesis.

Descriptors: (*Information theory, Photoelectric effect), (*Photoelectric effect, Demodulators), (*Demodulators, Photoelectric effect), Signalto-noise ratio, Lasers, Light communication systems, Wave functions, Quantum mechanics, Thermal radiation, Noise (Radio)

The probabilistic nature of the photoelectric conversion process augments other sources of noise in limiting the precision with which electromagnetic signals may be measured with a photoelectric detector. This report develops procedures for considering this added uncertainty in signal measurements of interest for radio type communication at optical frequencies. A probabilistic model of an ideal photodetector is used, in conjunction with the classical wave theory of thermal noise, to compute uncertainties associated with the lack of predictibility inherent in both photoelectric conversion and thermal processes. It is shown how the uncertainty in the detector output may be characterized by a signal-to-noise ratio, and also how decision criteria for signal detection may be based on the probability functions which characterize the detector output. (Author)

**AD-628 684 Fld. 9/4, 6/3**
**CFSTI Prices: HC $3.60 MF $0.50**
*THOMAS J WATSON RESEARCH CENTER YORKTOWN HEIGHTS N Y*
**THE LOEVE-KARHUNEN EXPANSION AS A MEANS OF INFORMATION COMPRESSION FOR CLASSIFICATION OF CONTINUOUS SIGNALS.**
Final rept. 15 Jul 63-14 Jul 64,
by Satosi Watanabe. Oct 65, 34p. Contract AF 33 (657)-11347, Proj. AF-7233, Task 723305,
AMRL TR-65-114

Unclassified report

Descriptors: (*Information theory, Classification), (*Mathematical logic, Information theory), Signals, Data processing systems, Series, Biophysics

The present paper is concerned mainly with the aspect of information compression, which is only part of the process of recognition. The problem of zoning (division of the space into disjoint volumes corresponding to classes) and the problem of decision making (such as the Bayesian algorithm) require, among others, careful study in connection with classification and recognition, but are not included in this paper.

**AD-628 711 Fld. 9/4, 20/3**
**CFSTI Prices: HC $20.80 MF $1.25**
*DELAWARE UNIV NEWARK DEPT OF ELECTRICAL ENGINEERING*
**QUANTUM FIELD THEORETICAL MODELS OF COMMUNICATION SYSTEMS.**
Technical rept.,
by Lawrence F. Jelsma. Jun 65, 212p. Rept. no. TR-Q52,
Contract AF-AFOSR-2-65, Proj. AF-9768, Task 976802,
AFOSR 66-0294

Unclassified report

Descriptors: (*Information theory, Quantum mechanics), (*Field theory, Information theory), (*Quantum mechanics, Information theory), Equations of motion, Harmonic generators, Statistical functions

Basic concepts in quantum field theory are used to represent communication systems. Maxwell's equations are reduced to the equations of motion of the forced simple harmonic oscillator and quantized in the Heisenberg picture. The state of a communication system is represented by a statistical density operator satisfying the postulate that the system can be in either a vacuum state or a maximum entropy state. Probability functions are derived representing the statistics of a communication system. (Author)

**AD-628 725 Fld. 9/4, 12/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y*
**ERRORS IN THE MEASUREMENT OF THE PROBABILITY DENSITY FUNCTION.**
Final rept.,
variance, Vocabulary, Semantics, Frequency

by Miles H. Bickelhaupt Jr.. Nov 65, 91p. Rept. no. RADC-TR-65-432, Proj. DU 63-25.

Unclassified report

Descriptors: (*Distribution functions, Probability), (*Statistical functions, Signals), Errors, Measurement, Information theory

This report reviews common sources of error produced in the measurement of the probability density function of a random signal. The processing time error problem is formulated for the digital computer, for solution through the use of tables and for several approximate solutions. Results are computed and compared. Other forms of error are reviewed in much less detail. (Author)

**AD-628 808 Fld. 9/4, 9/5**
**CFSTI Prices: HC $5.60 MF $0.50**
*DELAWARE UNIV NEWARK DEPT OF ELECTRICAL ENGINEERING*
**PHOTOELECTRON STATISTICS FOR VARIABLE TIME AND BANDWIDTH.**
Technical rept.,
by Abdul Q. Haideri. Sep 65, 55p. Rept. no. TR-Q53,
Contract AF-AFOSR-2-65, AFOSR 66-0308

Unclassified report

Descriptors: (*Information theory, Photoelectric effect), (*Demodulators, Photoelectric effect), Signals, Light, Noise, Theory, Photoelectrons, Analysis of variance, Field theory

The photoelectric measurement of optical signals may be limited both by random fluctuations in signal strength and by the probabilistic nature of the photoelectric detector. The mean square fluctuation, in number of electrons released in a photoelectric detector, illuminated by a coherent light signal in the presence of thermal noise, is calculated. The results are illustrated by a graph which shows how the dependence of the relative fluctuation in number of photoelectrons on signal strength is affected by both the time-bandwidth product and the mean number of photoelectrons per observation time. (Author)

**AD-628 807 See Fld. 9/5**

**AD-628 864 See Fld. 5/1**

## 9/5. SUBSYSTEMS

**AD-628 110 Fld. 9/5, 9/2, 9/1**
**CFSTI Prices: HC $4.00 MF $0.75**
*NAVAL AVIOMICS FACILITY INDIANAPLOIS IND*
**CODED CIRCUIT ANALYSIS. VOL. I. INSTRUCTION MANUAL FOR DC-AC APPLICATIONS.**
Technical rept.,
by Larry M. Turpin. 6 Sep 65, 106p. Rept. no. NAFI-TR-544,
Task RREN-040131/2871/F008-21-01,

Unclassified report

Descriptors: (*Programming (Computers), Circuits), (*Instruction manuals, Programming (Computers)), (*Circuits, Performance (Engineering)), Design

This report contains information about the Computer Oriented Design of Electronics Devices (CODED) Circuit Analysis programs; procedures for their use, applications, capabilities, limitations, and examples. Two of the CODED programs discussed in this report are for AC analysis and two for DC analysis. (Author)

**AD-628 113 Fld. 9/5, 9/1**
**CFSTI Prices: HC $2.60 MF $0.50**
*ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB*
**NECESSARY AND SUFFICIENT CONDITIONS FOR REALIZABILITY OF GIVEN SWITCHING FUNCTIONS,**
by Shunichi Toida. Jan 66, 24p. Rept. no. R-279,
Contract DA-28-043-AMC-00073 (E), AF-AFOSR-931-65 Proj. DA-20014501B31F

Unclassified report

Descriptors: (*Electrical networks, Switching circuits), Graphics, Synthesis, Algebra, Mathematical logic

In this paper the author established a relationship among switching functions between any two points of a contact network and proved that the relationship is in fact necessary and sufficient for switching functions to be assigned to an actual contact network, that is, realizable. In addition he picked up one particular type of switching function, that is, single-contact switching functions and established a necessary condition for switching functions to be single-contact. (Author)

**AD-628 117 Fld. 9/5, 17/2.1**
**CFSTI Prices: HC $4.60 MF $0.50**
*RADIO CORP OF AMERICA CAMDEN N J COMMUNICATIONS SYSTEMS DIV*
**MODULES (INTEGRATED CIRCUITS) FOR COMMUNICATIONS.**
Quarterly rept. no. 1, 4 Jan-31 Mar 65,
by A. M. Hoque. Jan 66, 50p. Contract DA-28-043-AMC-00454 (E), Proj. DA-1P6-22001-A-057-03,

Unclassified report

See also AD-627 914.

Descriptors: (*Communication equipment, Integrated circuits), (*Intermediate frequency amplifiers, Integrated circuits), (*Transponders, Integrated circuits), (*Integrated circuits, Tests), Analog systems, Optimization, Video amplifiers, Logarithmic amplifiers, Identification systems, Broadband, Tuned amplifiers, Performance (Engineering)

The purpose of the 'Modules (Integrated Circuits) for Communications' Program is to demonstrate the application of integrated circuits in analog communications equipment; the demonstration vehicle being a IF - video functional assembly for the Mark X IFF Transponders. The requirements of the IF-video functional assembly have been evaluated and the design approach of a Lin-Log 60-megacycle IF amplifier using a successive detection technique has been selected. An analysis of the preliminary circuit and the integrated circuit device requirement has been performed. A number if integrated circuit devices for the Lin-Log amplifier have been evaluated and appear to satisfy the circuit requirements. The RCA TA-5037 appears to be the most suitable for this application. A breadboard IF assembly will be constructed to determine the overall performance of the device in an amplifier. Additional devices will be tested to determine if an improvement in the gain bandwidth can be obtained. (Author)

**AD-628 157 Fld. 9/5**
**CFSTI Prices: HC $3.60 MF $0.50**
*LENKURT ELECTRIC CO INC SAN CARLOS CALIF*
**AMPLIFIER ASSEMBLY AM-4006 ( ) /FCC-17 (SUPERGROUP CARRIER AMPLIFIER).**
Technical rept., Phase A,
by D. D. Whipple, and J. Sepe. 21 Jan 66, 31p.
Contract AF 30(635)-11188,
RADC TDR-63-507-Vol-1

Unclassified report

Descriptors: (*Radiofrequency amplifiers, Design), Multiplex, Radio communication systems, Reliability (Electronics), Medium frequency

This report contains a summary of the design and development problems and a detailed theoretical discussion of the Supergroup Carrier Amplifier. The Supergroup Carrier Amplifier was designed and developed to increase the load capability of up to six supergroup carrier frequencies, supply each of the six supergroup carrier frequencies to two supergroup modulators or, by proper strapping, supply each of two supergroup carrier frequencies to six supergroup modulators. The predicted Mean-Time-Between-Failure of the Supergroup Carrier Amplifier is 3330 hours with an estimated Point Availability of 99.992 percent. (Author)

**AD-628 158 Fld. 9/5**
**CFSTI Prices: HC $2.60 MF $0.50**
*LENKURT ELECTRIC CO INC SAN CARLOS CALIF*
**AMPLIFIER ASSEMBLY AM-4006 ( ) /FCC-17 (SUPERGROUP CARRIER AMPLIFIER).**
Technical rept., Phase B,
by Forrest N. Easley. 21 Jan 66, 27p. Contract AF 30(635)-11188,
RADC TDR-63-507-Vol-2

Unclassified report

Descriptors: (*Radiofrequency amplifiers, Production), Performance (Engineering), Medium frequency, Multiplex, Radio communication systems

This report contains a chronological summary of fabrication and Category I Testing of Amplifier Assembly AM-XXXX (XW-1) /FCC-17. The Amplifier Assembly was designed to increase the load capability of up to six supergroup carrier frequencies. (Author)

**AD-628 217 Fld. 9/5, 20/14**
**CFSTI Prices: HC $2.60 MF $0.50**
*NAVY UNDERWATER SOUND LAB NEW LONDON CONN*
**THE QUASI-STATIC FIELDS OF DIPOLE ANTENNAS - PART II.**
Research rept.,
by Peter R. Bannister, and William C. Hart. 8 Feb 66, 27p. Rept. no. USL-719,
Proj. SF-106-01-02-7077,

Unclassified report

See also AD-626 321.

Descriptors: (*Dipole antennas, Electromagnetic fields), (*Electromagnetic fields, Dipole antennas), (*Antenna radiation patterns, Dipole antennas), Dipole moments, Electromagnetism

The electric and magnetic field components produced by vertical and horizontal electric dipoles are presented for the quasi-static range of absolute value gamma sub o rho $<<1<$ absolute value gamma sub 1 rho with absolute value gamma sub oz$<<1$, h = 0, and z >or = 0. The special case of burying the transmitting dipole (h <or =0) is also considered. This range has been considered by many writers, but with the restriction that rho >>z. In this report, the authors evaluate the previously underived (to the author's knowledge) components that are valid for any height z (neglect-in ionospheric effects). (Author)

**AD-628 271 Fld. 9/5**
**CFSTI Prices: HC $3.60 MF $0.50**
*SPERRY MICROWAVE ELECTRONICS CO CLEARWATER FLA*
**BROADBAND HARMONIC GENERATORS.**
Quarterly rept. no. 1, 21 Jun-21 Sep 65,
by R. P. Chambers. Oct 65, 36p. Rept. no. SJ-220-0059-1,
Contract DA-28-043-AMC-01256 (E), Proj. DA-1P6-22001-A-056, Task 1P6-22001-A-056-04, ECOM 01256-1

Unclassified report

Descriptors: (*Harmonic generators, Broadband), (*Broadband, Harmonic generators), Solid state physics, Varactor diodes, Circuits

The design goals for a broadband, solid state, Ku band tripler and the general circuit requirements to obtain these goals are presented. Reasons for selecting the form of the first basic tripler are discussed as well as its utilization in an alternate approach which dispenses with the idler circuit as a distinct quantity. An output filter-transformer is described and equations are derived for the relationships between hardware parameters and prototype parameters. Design curves for a three-section Tchebycheff prototype filter are included. The theoretical curves of varactor to obtain theoretical diode parameters. (Author)

**AD-628 324 Fld. 9/5, 9/1**
**CFSTI Prices: HC $5.60 MF $0.50**
*GEORGIA INST OF TECH ATLANTA ENGINEERING EXPERIMENT STATION*
**STUDY OF RECEIVER MIXER CHARACTERISTICS.**
Quarterly rept. no. 2, 1 Sep-1 Dec 65,
by Ernest E. Donaldson,Jr., Robert D. Trammell,Jr., and Richard W. Moss. Jan 66, 55p.
Rept. no. A-868-2,
Contract DA-28-043-AMC-01426 (E), Proj. DA-1E6-20501-D-449,
ECOM 01426-2
Unclassified report

See also AD-623 912.

Descriptors: (*Mixers (Electronic), Diodes), (*Diodes, Mixers (Electronic)), Mixer tubes, Nonlinear systems, Electronic switches, Electrical properties, Performance (Engineering)

The response generating properties of diode mixers are investigated for a wide range of signal and local oscillator input levels. Experimental results are shown which verify that for large signal input evels, the diode approximates a switching device rather than a nonlinear mixing device. Prediction methods for diodes operated in a switching state are presented, and the complexity of prediction and analysis problems for diodes operated over varying ranges of signal levels is discussed. A pentode mixer with separate grid injection was studied in an effort to determine the effects of the tube operating parameters on spurious product formations. Response levels were recorded as a function of signal input level, control grid bias, and suppressor grid bias. The results show that pentode mixer response generation as a function of its operating parameters is extremely complex, and critically dependent upon incremental or programmed parameter changes. The data implies that realistic prediction methods will be difficult to achieve, and that future prediction efforts may of necessity be confined to maximum-upper-bound techniques. (Author)

**AD-628 486 Fld. 9/5, 20/1, 9/3**
**CFSTI Prices: HC $1.60 MF $0.50**
*NAVAL ORDNANCE LAB WHITE OAK MD*
**SPAR HYDROPHONE CALIBRATION SYSTEM,**
by Charles B. Leslie. 3 Jan 66, 19p. Rept. no. NOLTR-65-237,
Task RUTO-3E-000/F108-02-09,
Unclassified report

Descriptors: (*Hydrophones, Calibration), Oscillators, Circuits, Design, Wiring diagrams

The hydrophone calibration system for the SPAR research vehicle is described in this report including the design philosophy, circuit diagrams, and test results. The system permits remote control calibration of any of 6 channels at up to 10 frequencies and 6 levels with an accuracy of better than plus or minus 1 db. (Author)

**AD-628 500 Fld. 9/5, 9/1**
**CFSTI Prices: HC $7.60 MF $0.75**
*RADIO CORP OF AMERICA MOORESTOWN N J MISSILE AND SURFACE RADAR DIV*
**TRANSVERSE ANTENNA FEEDS.**
Final rept., Jan 63-Dec 65,
by David F. Bowman. Jan 66, 71p. Contract AF 19(628)-2758, Proj. AF-4600,
AFCRL 66-49
Unclassified report

See also AD-607 477.

Descriptors: (*Antenna feeds, Reflectors), (*Reflectors, Antenna feeds), (*Antennas, Electromagnetic wave reflections), (*Electromagnetic wave reflections, Antenna feeds), Polarization, Antenna radiation patterns, Optics, Geometry

This study of the transverse focal region of a spherical reflector includes theoretical analyses centered on geometric optics, on vector polarization and on diffraction integrals of physical optics and their evaluation by the method of stationary phase. The results of the numerical evaluation of the focal region field for an incoming wave of uniform amplitude and phase agree with experimental measurements taken on a 10-ft. spherical reflector operating at 24 Gc. An annular step disc feed was designed using the calculated field as a basis. This transverse feed is designed to correct for spherical aberration over an included angle of the sphere of 120 degrees. The measured secondary patterns show agreement with the theory in the region of the main lobe. The disagreement in the area of the side lobes is attributed partly to blockage introduced by the feed horn support and partly to incomplete control of illumination amplitude. Methods are described for minimizing complexity due to polarization and for determining feed distributions required for non-uniform amplitude aperture distributions. (Author)

**AD-628 502 Fld. 9/5, 9/1**
**CFSTI Prices: HC $9.60 MF $0.75**
*RADIO CORP OF AMERICA MOORESTOWN N J MISSILE AND SURFACE RADAR DIV*
**TRASVERSE FOCAL REGION FIELDS OF A SPHERICAL REFLECTOR.**
Scientific rept.,
by Geoffrey Hyde. Jan 66, 89p. Rept. no. Scientific-2,
Contract AF 19(628)-2758, Proj. AF-4600,
Task 460007,
AFCRL 66-48
Unclassified report

See also AD-628 500.

Descriptors: (*Antenna feeds, Reflectors), (*Reflectors, Antenna feeds), (*Antennas, Electromagnetic wave reflections), (*Electromagnetic wave reflections, Antenna feeds), Mathematical models, Antenna radiation patterns, Optics, Geometry

The method of stationary phase is used to evaluate the focal region fields of a spherical reflector. First, the applicable consequences of earlier studies of geometric optics and polarization properties of a spherical reflector are reviewed. Then an integral formulation of the focal region fields is made. This integral is evaluated by the method of stationary phase. The stationary phase model of the focal region fields is evaluated numerically for various values of parameters. The graphs of the computations are discussed in detail. Finally, a comparison between theory and measurement is shown. The details of the stationary phase evaluation are given in Appendix A. The computer program for numerical evaluation of the focal region fields is given in Appendix B. Finally, in Appendix C, experimental work on a circular cylinder pillbox analog of the spherical reflector is discussed. (Author)

**AD-628 670 Fld. 9/5, 9/2, 9/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*ILLINOIS UNIV URBANA DEPT OF COMPUTER SCIENCE*
**AN APPLICATION OF INTERCOUPLED-TRANSMISSION-LINE-AMPLIFIER.**
Technical rept.,
by Chushin Afuso. 1 Nov 65, 23p. Rept. no. 193, Contract Nonr-1834 (15),
Unclassified report

Descriptors: (*Computer logic, Pulse amplifiers), (*Transmission lines, Pulse amplifiers), (*Pulse amplifiers, Transmission lines), Tunnel diodes, Coupling circuits, Computers, Voltage, Gain

An attempt has been made to use in intercoupled transmission line with tunnel diodes as a pulse amplifier for driving, in particular, high-speed diode logic circuits. For this purpose hot-electron diodes were used. The voltage swing of the amplifier is limited by the characteristics of tunnel diodes. It is not large enough to drive hot-electron diodes without bias. Hence it is necessary to bias the diodes properly. A satisfactory result was obtained for the case where overall voltage gain, including voltage attenuation due to internal resistance of hot-electron diodes, was less then unity. Further trails to obtain a higher voltage gain have been done. The results were not satisfactory, however. (Author)

**AD-628 677 Fld. 9/5**
**CFSTI Prices: HC $4.00 MF $0.75**
*CALIFORNIA UNIV BERKELEY ELECTRONICS RESEARCH LAB*
**SYNTHESIS OF INTEGRATED SELECTIVE AMPLIFIERS FOR SPECIFIED RESPONSE AND DESENSITIVITY.**
Research rept.,
by Amnon A. Gaash. 19 Jun 65, 109p. Rept. no. ERL-65-31,
Contract AF-AFOSR-139-64 ,AF-AFOSR-139-65
Unclassified report

Descriptors: (*Band-pass amplifiers, Integrated circuits), (*Integrated circuits, Band-pass amplifiers), Design, Theory, Mathematical analysis, Sensitivity, Microminiaturization (Electronics), Feedback amplifiers, Networks, Linear systems, Semiconductor devices, Functions

The fundamental objective of the report is the realization of highly selective, bandpass network functions in the medium of semiconductor integrated circuitry. Realization of such circuit performance has to take into consideration the special properties of integrated, monolithic microcircuitry. In view of the unavoidable dependence of integrated passive and active components on environmental conditions and on manufacturing tolerances, synthesis procedures via sensitivity functions are explored. Attention is focused on closed sensitivity formulations in order to reveal extra degrees of freedom available for desensitization. To that end, various sensitivity functions in single-loop and multi-loop feedback structures are investigated. The effect of the variation of integrated passive components is then assessed. The corresponding sensitivity contributions are shown to be independent of the circuit configuration and are expressed in form of sensitivity invariants. Based on the sensitivity formulation, sensitivity criteria are incorporated into the synthesis procedures, permitting simultaneous realization of specified response and sensitivity. The procedures make use of multi-loop feedback structures, wherein redundant transmission loops are introduced together with the correlated nature of the time-dependent and time-independent changes of integrated components.

**AD-628 769 Fld. 9/5**
**CFSTI Prices: HC $2.60 MF $0.50**
*MICROWAVE ELECTRONICS CORP PALO ALTO CALIF*
**INVESTIGATIONS OF BROADBAND FERROMAGNETIC POWER LIMITERS AND EXPANDERS AS DUPLEXING ELEMENTS FOR MICROWAVE SYSTEMS.**
Quarterly progress rept. no. 2, 1 Sep-30 Nov 65,
by Frank Peternell. Feb 66, 21p. Contract DA-

28-043-AMC-01372(E), Proj. DA-1P6-22001-A-055,

Unclassified report

Descriptors: (*Limiters, Ferromagnetic materials), (*Ferromagnetic materials, Microwave equipment), (*Duplexers, Ferromagnetic materials), Helixes, Broadband, Yttrium compounds, Iron compounds, Garnet

Major effort during this past quarter has been to investigate a broadband traveling-wave limiter. A smooth passband of 1.4 GHz bandwidth has been realized and studies of limiter properties are continuing. Fabrication of a low-loss helix structure for the expander has begun. Preliminary investigations of ultrapure YIG samples have been made in an effort to understand the high level insertion loss observed in expander tests. (Author)

**AD-628 807 Fld. 9/5, 9/4**
**CFSTI Prices: HC $6.60 MF $0.75**
*DELAWARE UNIV NEWARK DEPT OF ELECTRICAL ENGINEERING*
**MAXIMIZATION OF TRANSINFORMATION IN PHOTODETECTION.**
Technical rept.,
by John C. Murray,Jr.. Jun 65, 62p. Rept. no. TR-Q51,
Contract AF-AFOSR-2-65, Proj. AF-9768, Task 976802,
AFOSR 66-0309

Unclassified report

Descriptors: (*Demodulators, Photoelectric effect), (*Information theory, Demodulators), Light communication systems, Calculus of variations, Probability, Numerical analysis, Signals

A photodetector is considered as a communication channel and a study made of the maximum information per degree of freedom I which can be transmitted through the channel. Application of the calculus of variations yields a necessary equation which the input probability must satisfy when I is a maximum. It is found that for large average signal energy this necessary equation is satisfied when the input signal energy has an exponential probability density. The dependence of I an average signal energy with an input probability of this maximizing form is calculated numerically. (Author)

**AD-628 833 Fld. 9/5, 13/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*DOUGLAS AIRCRAFT CO INC SANTA MONICA CALIF MISSILE AND SPACE SYSTEMS DIV*
**STRESS ANALYSIS OF ENCAPSULATION MATERIALS FOR WELDED MODULES,**
by M. H. Smith. Feb 66, 61p. Rept. no. SM-48410,

Unclassified report

Descriptors: (*Modules (Electronic), Encapsulation), (*Encapsulation, Materials), (*Packaging, Test equipment (Electronics)), Welds, Strain gages, Epoxy plastics, Transducers, Stresses, Mathematical Analysis, Embedding substances

A strain-gauge load transducer, simulating an axial-leaded discrete component, was developed and fabricated by DAC to measure the magnitude and direction of axial stresses exerted by an encapsulating material. The epoxy encapsulation materials exhibited residual compressive stresses due to the initial cure of resin. Thermal cycling substantially increased these compressive stresses at the lowest temperatures. Tensile stresses were recorded during the elevated temperature phase of the test. Compressive stresses were produced as the cycle was completed forming a closed hysteresis loop, characteristic of these materials, on the stress vs. temperature curve. Within a typical cordwood welded module with component density levels of 10-30 percent, the stress levels were reduced by increasing levels of component loading. The low-density, microballoon-filled Stycast 1090/11 epoxy material exhibited significantly lower, more uniform tensile and compressive stresses than the medium-density, mineral-filled Hysol 4215/3561 (9709466, Type I) epoxy material within this same test configuration. (Author)

**AD-628 858 Fld. 9/5, 20/12**
**CFSTI Prices: HC $1.60 MF $0.50**
*CHATHAM ELECTRONICS DIV TUNG-SOL ELECTRIC INC LIVINGSTON N J*
**HIGH SPEED POWER AMPLIFIER USING AN ELECTRON SWITCHED P-N JUNCTION.**
Quarterly interim development rept. no. 3, 27 Nov 65-27 Feb 66,
by Nelson E. Ake. 27 Feb 66, 17p. Contract N0bsr-93306,

Unclassified report

Descriptors: (*Solid state physics, Power amplifiers), (*Power amplifiers, Diodes (Semiconductor)), (*Diodes (Semiconductor), Power amplifiers), Semiconductor devices, Performance (Engineering), Leakage (Electrical), Resistance (Electrical), Silicon compounds, Dioxides, Penetration, Electron beams, Vacuum, Pulse amplifiers

A planar silicon dioxide passivated diode has been designed and fabricated for the EBM tube. The typical reverse electrical characteristics of the diode are a reverse voltage breakdown of 700-1000 volts with a maximum reverse leakage current of 3 micro amps at 600 volts reverse bias. The starting material is 'N' float zone bulk silicon with a resistivity in the range 70-125 ohms-cm. Some difficulty was encountered in making a diode with a reverse voltage breakdown of 700 volts with starting material below approximately 125 ohms-cm. However, it has been demonstrated that diodes with reverse voltage breakdowns of greater than 700 volts can be made with starting material of 60 ohms-cm. Lower starting resistivity material provides a lower parasitic resistance in the device during the conduction cycle. It has been demonstrated that these diodes will remain good for extended periods under environmental conditions simulating the inside of a vacuum tube. (Author)

**AD-628 859 Fld. 9/5, 20/14**
**CFSTI Prices: HC $1.00 MF $0.50**
*WISCONSIN UNIV MADISON DEPT OF ELECTRICAL ENGINEERING*
**SURFACE WAVE AND ANTENNA ENGINEERING RESEARCH STUDY.**
Quarterly progress rept. no. 10, 1 Dec 63-29 Feb 64,
by Elmer H. Scheibe. 31 Mar 64, 22p. Contract DA-36-039-sc-85188, Proj. DA-3A-99-20-001-07,

Unclassified report

Descriptors: (*Horn antennas, Antenna radiation patterns), (*Wave transmission, Horn antennas), Transmission lines, Dielectric properties, Microwave networks, Waveguide couplers, Gases, Electromagnetic lenses, Phase (Electronics), Corrections, Resonators, Extremely high frequency, Waveguides, Antennas

A phase correcting lens to be used in conjunction with a diagonal horn was designed and fabricated. Measurements show that the field of this horn and phase corrector combination closely simulates the field of the lowest loss made of the beam waveguide. The effectiveness of the horn-lens combination as a launcher of the beam waveguide mode must yet be measured. A method for measuring the dielectric constant of gases using a dual mode beam waveguide resonator was devised. The dielectric constant of dry air at various pressures has been measured at a frequency of 34 Gc. The value obtained at standard pressure and temperature agrees to within 0.0005% of that given by the Bureau of Standards for a frequency of 9 Gc. (Author)

**AD-628 100** See Fld. 14/4

**AD-628 506** See Fld. 10/2

**AD-628 535** See Fld. 9/1

**AD-628 581** See Fld. 1/3

**AD-628 693** See Fld. 17/2

**AD-628 771** See Fld. 20/14

**AD-628 778** See Fld. 20/14

**AD-628 808** See Fld. 9/4

# Field 10-ENERGY CONVERSION (NON-PROPULSIVE)

## 10/1. CONVERSION TECHNIQUES

**AD-628 049 Fld. 10/1**
**CFSTI Prices: HC $5.00 MF $1.00**
*NAVAL RESEARCH LAB WASHINGTON D C*
**DIRECT ENERGY CONVERSION LITERATURE ABSTRACTS.**
Dec 65, 156p.

Unclassified report

Descriptors: (*Energy conversion, Abstracts), Thermoelectricity, Thermionic converters, Photoelectric effect, Magnetohydrodynamics, Electrochemistry, Nuclear reactors, Bibliographies, Patents

This is the tenth in a series of bibliographies covering unclassified literature related to the direct conversion of energy. Subject coverage includes energy conversion, thermoelectricity, thermionics, photovoltic, magnetohydrodynamics, electrohydrodynamics, electrochemical, nuclear and energy storage.

**AD-628 529 Fld. 10/1, 7/4**
**CFSTI Prices: HC $3.00 MF $0.50**
*STANFORD UNIV CALIF DEPT OF MECHANICAL ENGINEERING*
**DIRECT ENERGY CONVERSION SYSTEMS. PART II. ELECTROCATALYTIC ACTIVITY OF HYDRAZINE IN FUEL CELL APPLICATION.**
Quarterly technical rept.,
by Paul D. Stonehart. 30 Sep 65, 67p. Contract AF 49 (638)-1123,ARPA Order-246 Proj. AF-4661,
AFOSR 66-0226

Unclassified report

Descriptors: (*Energy conversion, Fuel cells), (*Fuel cells, Catalysis), (*Hydrazine, Fuel cells), (*Carbon monoxide, Fuel cells), Electrodes, Electrochemistry, Acids, Bases (Chemistry), Oxidation-reduction reactions, Platinum, Chemical bonds, Films, Carbon dioxide, Oxides, Methanols, Chemical reactions

The electrode reactions of hydrazine in acid and basic solutions on smooth and platinised platinum were examined. From analysis of the rest potentials and concentration relationships a rapid one electron exchange with a stable surface species is postulated. The mechanism of oxidation occurs via a sequential system whereby hydrazinium radicals are the products of the initial oxidation. The electrode reactions of carbon monoxide in acid solutions on smooth platinum electrodes were also examined. The carbon monoxide is strongly bound to the metal surface and probably exists as a compound. Suppression of the reversible hydrogen reaction was observed in the presence of CO. Removal of the carbon monoxide film was performed as soon as oxide formation occurred indicating that

the carbon monoxide is essentially electroinactive and that the reaction is purely chemical with the metal oxide to form carbon dioxide. Electrochemical regeneration of the metal oxide forms the regenerative cycle. M0 + C0 > M + C02; M + H20 > M0 +2H+ 2e-. The oxidation of methanol in acid does not proceed via carbon monoxide as an intermediate. (Author)

**AD-628 528 See Fld. 20/9**

## 10/2. POWER SOURCES

**AD-628 071 Fld. 10/2, 7/4**
**CFSTI Prices: HC $4.00 MF $0.75**
*TYCO LABS INC WALTHAM MASS*
**ELECTROCHEMISTRY OF FUEL CELL ELECTRODES.**
Final rept. 1 Apr 62-15 Oct 65,
by A. C. Makrides, S. B. Brummer, and J. N. Butler. 15 Oct 65, 116p. Contract Nonr-3765 (00),ARPA Order-302-62 Proj. 9800 ,NR-359-443

Unclassified report

Descriptors: (*Fuel cells, Electrodes), (*Electrodes, Fuel cells), Oxygen, Hydrogen, Hydrocarbons, Oxidation, Mercury alloys, Oxides, Platinum, Nickel alloys, Indinum alloys, Thallium alloys, Catalysis, Reaction kinetics, Abstracts

The report is an extended abstract of the main results on a program which dealt with electrochemistry of fuel cell reactions, and included studies on the hydrogen reaction, the oxidation of organic fuels, and oxygen reduction. The clarification of the role of the electrode in catalyzing fuel cell reactions was the central theme of this work. In order to establish the relation of electrocatalytic activity to electrode composition it is necessary first to understand in detail the mechanism of the reaction of interest. The simplest reaction studied was the hydrogen reaction, and in this case, it was possible to show that electrocatalytic activity is dependent on the electronic structure rather than the surface composition of the electrode. The oxidation of organic fuels and oxygen reduction are more complicated reactions and the work with these reactions was directed primarily towards elucidating their kinetics and mechanisms. A summary of the main experimental results, of the conclusions reached, and of the implications of these studies in the development of fuel cells is given in Section II of this report. Detailed abstracts of the work done under this contract, and published in various journals, are given in Section III. (Author)

**AD-628 129 Fld. 10/2**
**CFSTI Prices: HC $2.60 MF $0.50**
*ALLIS-CHALMERS MFG CO MILWAUKEE WIS SPACE AND DEFENSE SCIENCES DEPT*
**DESIGN OF HYDROGEN-OXYGEN CAPILLARY TYPE FUEL CELL.**
Quarterly technical progress rept. no. 9, 1 Nov 65-31 Jan 66.
15 Feb 66, 28p. Contract AF 33 (615)-1185,

Unclassified report

See also AD-624 158.

Descriptors: (*Fuel cells, Design), (*Hydrogen, Fuel cells), (*Oxygen, Fuel cells), Spacecraft components, Electric power production, Capillary tubes, Vacuum apparatus, Flight testing

After completion of development testing, Milestone 5, Design Freeze, was achieved. Motion qualification testing was successfully completed using Module Number 1 during January 1966. The thermao-vacuum qualification testing will commence when fuel cell plates for Module Numbers 2 and 3 are delivered and the modules are assembled - expected to be the end of February 1966. All parts for all of the remaining modules are scheduled to be delivered during March 1966. The Orbital Fuel Cell Package, which was damaged during the aborted launch attempt, has been returned to Allis-Chalmers. (Author)

**AD-628 159 Fld. 10/2**
**CFSTI Prices: HC $4.60 MF $0.50**
*PRATT AND WHITNEY AIRCRAFT EAST HARTFORD CONN*
**500-WATT FUEL-CELL POWER PLANT.**
Interim rept. no. 1, 1 Oct 64-31 Oct 65,
by T. Schiller. Jan 66, 44p. Contract DA-28-043-AMC-00320 (E), Proj. DA-1C6-22001-A-053, Task DA-04,

Unclassified report

Descriptors: (*Fuel cells, Power supplies), (*Power supplies, Portable), Feasibility studies, Hydrogen, Air, Gas generating systems, Hydrocarbons, Fuels, Design

The purpose of the work required to be performed by the Contract is to demonstrate the feasibility of a man-portable, 500-watt, indirect, liquid hydrogen and air, fuel-cell power plant. Two independent units are to be developed - a hydrogen-generator assembly and a fuel-cell assembly. The hydrogen-generator assembly will convert the hydrocarbon fuel to hydrogen by steam reforming, and the fuel-cell assembly will electrochemically oxidize the hydrogen with air into electrical energy. The two units will be integrated for operation and designed to produce 500 watts of net electrical power. The report presents the technical approach to be used to establish the feasibility of a compact 500-watt, liquid-hydrocarbon and air, fuel-cell power plant. The work to date has consisted of design studies to establish power-plant configuration. These studies indicate that the power plant will meet Contract requirements.

**AD-628 171 Fld. 10/2, 7/4**
**CFSTI Prices: HC $3.60 MF $0.50**
*PENNSYLVANIA UNIV PHILADELPHIA ELECTRO-CHEMISTRY LAB*
**REVERSIBLE OXYGEN ELECTRODES.**
Quarterly rept. no. 2, 14 Jul-14 Oct 65,
by M. Genshaw, K. Wong, and A. Damjanovic. 14 Oct 65, 40p. Contract DA-28-043-AMC-01291 (E), Proj. DA-1C0-14501-A-34A Task 1C0 14501 A 34A00,

Unclassified report

See also AD-623 660.

Descriptors: (*Fuel cells, Cathodes), (*Cathodes, Fuel cells), (*Oxygen, Reduction (Chemistry)), Electrodes, Rhodium, Iridium, Impurities, Hydrogen peroxide, Water, Oxidation-reduction reactions, Electrolytes, Potassium compounds, Hydroxides, Sulfuric acid

The mechanism of oxygen reduction at rhodium electrodes was studied using the rotating disk electrode with a concentric ring. At pre-reduced, oxide free electrodes no H2O2 is formed either as an intermediate or in a reaction parallel to that of H2O formation. In the presence of 'impurities' H2O2 is produced in a parallel reaction to the main path for H2O production. At preoxidized Rh electrode, some H2O2 is produced, apparently in a path parallel to the main reduction path to H2O. The mechanism of O2 reaction on Ir electrodes was also determined. The path is the 'electrochemical oxide' path. (Author)

**AD-628 499 Fld. 10/2**
**CFSTI Prices: HC $4.60 MF $0.75**
*UNION CARBIDE CORP PARMA OHIO*
**MINIATURE HYDROGEN GENERATOR.**
Quarterly rept. no. 2, 1 Sep-30 Nov 65,
by J. E. Rothfleisch, and Lawrence M. Litz. Feb 66, 42p. Contract DA-28-043-AMC-01375 (E), Proj. DA-106-22001-A053, Task DA-106-22001-A053-04,
ECOM 01375-2

Unclassified report

See also AD-627 337.

Descriptors: (*Gas generating systems, Hydrogen), (*Hydrogen, Fuel cells), (*Fuel cells, Gas generating systems), Jet engine fuels, Pyrolysis, Gasoline, Portable, Performance (Engineering)

Thermal cracking of JP-4 and combat gasoline to give a mixture containing approximately 85-90 per cent H2 with the balance methane is readily accomplished at about 1100C. A strong temperature dependence is observed in the approach to equilibrium. Hydrogen yield improves as carbon build up in the reactor increases. As the time of contact increases (flow rate decreases), the product becomes richer in H2. An experimental JP-4 fuel-fired reactor was designed and built. It gave products consistent with the results obtained in the electrically heated tubes. Nickel and Inconel were found to be the best materials of construction. (Author)

**AD-628 506 Fld. 10/2, 9/5, 15/6, 14/2**
**CFSTI Prices: HC $30.70 MF $1.50**
*FIELD EMISSION CORP MCMINNVILLE OREG*
**DEVELOPMENT OF AN ULTRAFAST MODERATE ENERGY PULSE POWER SYSTEM.**
Technical rept. Apr 62-Jul 64,
by J. K. Trolan. Jan 66, 311p. Contract AF 29 (601)-5376, Proj. AF-5710 ,FEC 03-120000 Task 07.002,
AFWL TR-65-1

Unclassified report

Descriptors: (*Plasma generators, Exploding wires), (*Pulse generators, Exploding wires), (*Exploding wires, Pulse generators), Capacitors, Transmission lines, Coaxial cables, Electric discharges, Electric insulation, Power sources, Transducers, Vacuum apparatus, Nuclear explosion damage, Simulation

A unique pulse power system was constructed which generates very high energy density plasmas for the specific purpose of determining the electrical, thermodynamic and radiative properties of materials at high temperatures. Theoretical indications suggest that if a sufficiently fast rate of energy transfer is achieved, a very high temperature can be obtained even when there is only moderate stored energy (about 1000 joules) in the system. Therefore, the system was designed to provide a very fast rising pulse (less than 8 nsec to a peak current of approximately 70,000 amperes of short duration (50 nsec) for the case of a constant and matched 4.7 ohm load impedance. System design features are discussed including the parallel coupling of 15 synchronized 320 kv Marx-surge generators to an evacuatable transducer chamber by means of a multiple-input matched impedance transmission line. The developmental engineering of each of the major system components is documented, indicating the processes employed to ensure maximum system usefulness and reliability. (Author)

**AD-628 559 Fld. 10/2, 20/3**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**GALVANO-THERMOMAGNETIC PHENOMENA AND THE FIGURE OF MERIT IN BISMUTH. II. SURVEY OF EXPERIMENTAL DATA AND CALCULATION OF DEVICE PARAMETERS,**
by Theodore C. Harman, Jurgln M. Honig, and Lorella Jones. 17 Dec 64, 23p. Rept. no. JA-2501,
Contract AF 19 (628)-5167,
ESD TDR-66-25

Unclassified report

*Availability: Published in Advanced Energy Conversion, v5 p183-203 1965. Copies to DDC users only.*

Descriptors: (*Bismuth, Transport properties), (*Thermoelectricity, Bismuth), (*Magnetic properties, Bismuth), Numerical analysis, Experimental data, Relaxation time, Tensor analysis, Magnetic fields, Energy conversion

Transport theory, developed in a preceeding paper (Advanc. Energy Conv., v5, 1965) for pure Bi, is used to predict numerical values for various transport coefficients at about 80K; these are in good agreement with all available experimental data. The various effective masses, relaxation times, and mobilities relative to the pseudosymmetry axes are tabulated. Expressions are derived for the figures of merit and anisotropy parameters for a variety of limiting cases. The numerical predictions are again in substantial accord with direct experimental measurements. (Author)

**AD-628 250** **See Fld. 7/2**

## 10/3. ENERGY STORAGE

**AD-628 299 Fld. 10/3**
**CFSTI Prices: HC $1.10 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF STORING ELECTRICAL ENERGY,**
by N. E. Zaev. 5 Nov 65, 8p. Rept. no. FTD-TT-64-485, TT 66-60575

Unclassified report

Unedited rough draft trans. of Patent (USSR) 153 985, appl. 740615/26-10, 31 Jul 61.

Descriptors: (*Storage batteries, USSR), Electrodes, Dielectrics, Electrostatic generators, Voltage, Electrical engineering, Batteries + components

The proposed method is attained by the use as storing material a solid dielectric with predominately electron conductivity. The dielectric undergoes a long charging at high temperature (relative to the operating temperature on discharging) by a high voltage close to the disruptive. From contact metallized surfaces a high voltage of D C micrcurrent is obtained.

**AD-628 575 Fld. 10/3, 13/8**
**CFSTI Prices: HC $2.60 MF $0.50**
*BRIGHT STAR INDUSTRIES CLIFTON N J*
**ORGANIC DEPOLARIZED CELLS UTILIZING META-DINITROBENZENE.**
Quarterly progress rept. no. 1, 15 Jun-15 Sep 65, by Sol S. Jaffe, and John Peters. Jan 66, 30p. Contract DA-28-043-AMC-01401 (E), Proj. DA-1C6-22001-A-053, Task DA-02,

Unclassified report

Descriptors: (*Dry cells, Manufacturing methods), (*Nitrobenzenes, Dry cells), (*Batteries + components, Manufacturing methods), Magnesium, Magnesium perchlorates, Construction, Battery separators, Industrial equipment, Electrolytes, Electrodes, Seals (Stoppers)

A study was made of the techniques which have been utilized in fabricating cylindrical magnesium/magnesium perchlorate/m-dinitrobenzene dry cells on a laboratory scale in order to determine the principal features which require revision in adapting the procedures and construction to the methods of quantity production. As a result of the findings, a twin-shell liquid-solids blender, which in preliminary tests produced in a single operation a wet mix of satisfactory appearance and consistency, is being considered for use in preparing the depolarizer mixes. Comparison between the fold-over and the disk -and-washer separator systems will be made in a statistically designed experiment utilizing A-size cells. The experiment will include also an exploration of the effect of differences in the carbon black, the wetness level, and the gas-permeability of the carbon rod. (Author)

# Field 11-MATERIALS

## 11/2. CERAMICS, REFRACTORIES, AND GLASSES

**AD-628 276 Fld. 11/2, 7/4, 7/2**
*AEROCHEM RESEARCH LABS INC PRINCETON N J*
**THE OXIDATION OF PYROLYTIC GRAPHITE AT TEMPERATURES OF 1400-1800F AND AT AIR VELOCITIES OF 25-100 CM/SEC,**
by D. E. Rosner, and H. D. Allendorf. 1965, 4p. Contract AF 49 (638)-1138 ,AF 49 (638)-1195 AFOSR 65-2489

Unclassified report

*Availability: Published in Journal of the Electrochemical Society v112 n6 Jun 1965. Copies to DDC users only.*

Descriptors: (*Pyrolytic graphite, Oxidation), (*Oxidation, Pyrolytic graphite), Reaction kinetics, Diffusion, Thermochemistry, Air, Ablation

Several questions relating to the high-temperature oxidation kinetics of pyrolytic graphite which were raised by M-Levy and P. Wong (J. Electrochem. Soc., v111, n9, p1088-1091) are discussed from the point of view of current investigations in the laboratory of Rosner and Allendorf. Topics include: Departures from Arrhenium behavior; kinetics of the attack of graphite by atomic oxygen; and diffusional effects for exothermic surface reactions.

**AD-628 282 Fld. 11/2, 7/4, 7/2**
*AEROCHEM RESEARCH LABS INC PRINCETON N J*
**HIGH-TEMPERATURE KINETICS OF GRAPHITE OXIDATION BY DISSOCIATED OXYGEN.**
Revised ed.,
by Daniel E. Rosner, and H. Donald Allendorf. 7 May 65, 2p. Contract AF 49 (638)-1195, AFOSR 65-2499

Unclassified report

Revision of manuscript submitted 30 Nov 64.

*Availability: Published in AIAA Journal p1522-3 Aug 1965. Copies to DDC users only.*

Descriptors: (*Graphite, Oxidation), (*Oxidation, Graphite), (*Ablation, Graphite), Reaction kinetics, Thermochemistry, Oxygen, Dissociation, Stagnation point, Probability

A report is given of preliminary researches on the true kinetics of the high-temperature oxidation of graphite by atomic and molecular oxygen. Implications of the results on ablation analyses are discussed.

**AD-628 396 Fld. 11/2, 20/2**
**CFSTI Prices: HC $1.60 MF $0.50**
*CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF METALLURGY AND MATERIALS SCIENCE*
**THE MECHANICAL PROPERTIES OF CERAMIC ALLOYS.**
Technical rept.,
by G. W. Groves, and D. A. Shockey. Feb 66, 15p. Rept. no. TR-1, Contract Nonr-760 (28) Proj. RR-007-02-01,

Unclassified report

Descriptors: (*Ceramic materials, Mechanical properties), (*Aluminum compounds, Oxides), (*Magnesium compounds, Oxides), (*Sapphires, Impurities), Alloys, Heat treatment, Microstructure, Crystal lattice defects, Fracture (Mechanics), Manganese, Single crystals, Solid solutions, Titanium

Deliberately impurified crystals of A1203 and Mg0 were prepared. The microstructure of a heat treated Mg0 crystal containing 0.2% Ti is described. An increase in the resistance to dislocation motion in this alloy as a result of heat treatment is reported. A production of steps on the fracture surface of a Mn-doped sapphire by distributed second-phase particles is described. (Author)

**AD-628 515 Fld. 11/2, 11/6, 7/4**
**CFSTI Prices: HC $2.60 MF $0.50**
*AEROCHEM RESEARCH LABS INC PRINCETON N J*
**KINETIC AND AERODYNAMIC ASPECTS OF THE OXIDATION OF MATERIALS BY PARTIALLY DISSOCIATED GASES.**
Final rept., 15 Nov 62-14 Nov 65,
by Daniel E. Rosner, and H. Donald Allendorf. 3 Dec 65, 27p. Rept. no. AeroChem TP-124, Contract AF 49 (638)-1195, Proj. 9750, Task 975001, AFOSR 66-0146

Unclassified report

Descriptors: (*Refractory materials, Oxidation), (*Refractory metals, Corrosion), (*Oidation, Reaction kinetics), Molybdenum, Oxygen, Dissociation, Tungsten, Graphite, Boron, Iridium, Chlorine, Hydroxides, Fluid flow, Transport properties, Chlorination, Dissociation, Ablation, Aerodynamics

A synopsis is presented of the most significant results of a three-year research program carried out on the oxidation kinetics of refractory materials in dissociated gases. Microwave-discharge fast flow system techniques, coupled with electrical resistance heating and monitoring of the reacting specimens were used throughout. Experimental results are included for the attack of (a) polycrystalline molybdenum, tungsten, graphite, iridium and vitreous boron by atomic oxygen, (b) polycrystalline molybdenum and nickel by atomic chlorine, and (c) polycrystalline molybdenum by hydroxyl radicals. Reactant (O, Cl, and OH) partial pressures were of the order of 0.001 to 0.05 and surface temperatures were within the range 400 to 2600K. A chronological list is provided of the seven publications and eleven reports describing these results and the underlying methods in greater detail. (Author)

**AD-628 610 Fld. 11/2, 20/12**
**CFSTI Prices: HC $1.60 MF $0.50**
*RESEARCH AND ADVANCED DEVELOPMENT DIV AVCO CORP WILMINGTON MASS*
**DIFFUSION STUDIES IN REFRACTORY MATERIALS.**
Summary rept. 1 Mar 65-28 Feb 66,
by B. J. Wuensch, and T. Vasilos. 28 Feb 66, 16p. Contract Nonr-4267 (00), Proj. RR-007-02-01,

Unclassified report

Descriptors: (*Refractory materials, Diffusion), (*Ceramic materials, Diffusion), Magnesium compounds, Oxides, Grain boundaries, Single crystals, Impurities, Ions, Transport properties, Nickle, Calcium, Stresses, Pressure

Results of studies of diffusion in a ceramic oxide are described. The objectives of the program are to (1) determine the origin of enhanced grain-boundary diffusion, (2) determine the effect, if any, of imposed stress on diffusion rates in single-crystals, and (3) determine diffusion rates for impurity cations whose segregation and precipitation is known to influence transport and mechanical properties. Magnesium oxide has been selected for study as a typical ceramic oxide. Grain boundary diffusion has been observed in certain bicrystals and polycrystal-line specimens. The effect, however, is extrinsic in nature, and has been

shown to arise from segregation, at grain boundaries, of the principal impurities contained within the MgO. No enhancement of Ni (2+) diffusion rates is observed in MgO subjected to four-point loadings of up to 5000 psi at temperatures between 1000 and 1300C. Similarly, no enhancement is noted in MgO subjected to compressive loads up to 15,000 psi at 1200C. Diffusion data obtained for Ca (2+) in single-crystal MgO may be described by an activation energy of 3.3 electron volts, and a value of D sub o equal to .025 sq cm/sec. Diffusion of Ca (2+) is up to two orders of magnitude slower than for other divalent impurity cations, and the present results may be influenced by fluorescence effects in the microprobe analysis, or by incompletely resolved immiscibility-gap discontinuities in the concentration profiles. (Author)

**AD-628 810 Fld. 11/2**
*NAVAL RESEARCH ESTABLISHMENT DARTMOUTH (NOVA SCOTIA)*
**PROPERTIES OF TRANSDUCER CERAMICS UNDER MAINTAINED PLANAR STRESS,**
by R. F. Brown, and G. W. McMahon. 1965, 8p.
Rept. no. NRE-65/8,
Proj. D108-55-25-04,

Unclassified report

*Availability: Published in Journal of the Acoustical Society of America, v38 n4 p570-5 Oct 1965. Copies to DDC users only.*

Descriptors: (*Ceramic materials, Piezoelectric transducers), (*Stresses, Ceramic materials), Underwater equipment, Barium compounds, Titanates, Lead compounds, Zirconates, Pressure, Dielectric properties, Piezoelectric effect

In order to predict the performance of certain types of deeply submerged underwater transducers, measurements have been made of the properties of piezoelectric ceramics as a function of pressure, time, and electric field. Planar compressive stresses up to 35 000 psi were imposed on barium titanate and lead zirconate titanate ceramic by subjecting thin hollow spheres to uniform external pressure. With increasing stress, the dielectric constant, piezoelectric constant, coupling factor, and elastic compliance decreased by as much as 70%, part of the change being permanent but most of it reversible. The stability of the ceramic properties with duration and number of cycles of the imposed stress varied widely with ceramic composition. Large increases in high-field dielectric loss were observed at high stress in ceramics usually considered suitable for high-power projectors. The results indicate that transducers that utilize ceramic under planar stress may suffer significant degradation in performance when deeply submerged. (Author)

**AD-628 387** **See Fld. 11/6**

**AD-628 424** **See Fld. 20/12**

**AD-628 664** **See Fld. 13/8**

## 11/3. COATINGS, COLORANTS, AND FINISHES

**AD-628 072 Fld. 11/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV*
**DEVELOPMENT OF AN IMPROVED RINSE SOLUTION FOR PHOSPHATE COATINGS THROUGH ADDITION OF ORGANIC ACIDS.**
Technical rept.,
by William O. Crawford. Jan 66, 25p. Proj. DA-1C024401A328,
RIA 66-67

Unclassified report

Descriptors: (*Phosphate coatings, Additives), (*Corrosion inhibition, Phosphate coatings), Chromium compounds, Carboxylic acids, Citric acids, Glutaric acid, Succinic acids, Phthalic acids, Salt spray tests

Work was undertaken in order to improve the salt spray resistance capabilities of phosphate coatings through innovations in the post treatment of the phosphate coatings and specifically through improvements in the supplementary rinse solutions. Various compounds, both organic and inorganic, were tested in solution, both by themselves and in combination with each other and with the existing chromic acid rinse solution, as possible rinses for phosphate coatings. It was found that four different 1-4 and 1-5 dicarboxylic acids, when used in the proper concentration with the existing 0.6 gm/liter (0.08 oz./gal.) chromic acid rinse increased the salt spray life of a phosphate coating by at least one hour over the salt spray life of a coating treated in the standard 0.6 gm/1 chromic acid rinse. These four acids are: citric acid, glutaric acid, maleic acid and succinic acid. It was also found that one aromatic dicarboxylic acid tested, phthalic acid, had the same effect on the salt spray life as the above mentioned aliphatic acids. (Author)

**AD-628 185 Fld. 11/3, 13/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE NAVY WASHINGTON D C*
**PROTECTION OF STEEL AND LIGHT ALLOYS WITH POLYVINYL BUTYRAL PHOSPHATIZING PRIMERS VL-023,**
by G. Ya. Terlo. 1966, 8p. Rept. no. translation-2060,
TT 66-60554

Unclassified report

Zashchita Stali i Legkikh Splavov Polivinilbutiralnymi Fosfatiruyushchimi Gruntami VL-023, trans. of Lakokrasochnye Materialy i Ikh Primenie (USSR) n5 p33-6 1964.

Descriptors: (*Plastic coatings, Corrosion inhibition), (*Acetal plastics, Corrosion inhibition), (*Corrosion inhibition, Acetal plastics), Paint primers, Phenolic plastics, Adhesion, Steel, Alloys, Protective treatments, USSR

It is shown that the newly developed phosphatized primers VL-023 based on medium-viscous polyvinylbutyral and modified phenol resins have high stability, water and atmosphere resistance, excellent covering capability and dispersion. It is also shown that the primers VL-023 can be used for protection of metal against atmospheric corrosion during the period of inter-operational preservation (replacing phosphatized salt 'mazhef' and oiling). (Author)

**AD-628 194 Fld. 11/3, 14/2, 13/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE NAVY WASHINGTON D C*
**RAPID METHODS OF TESTING ANTIFOULING PAINTS FOR OCEAN-GOING SHIPS,**
by V. N. Glotev, E. S. Gurevich, and E. I. Geine. 1966, 12p. Rept. no. Translation-2059,
TT 66-60557

Unclassified report

Ob Uskorennykh Metodakh Ispytaniya Neobrastaiushchikh Krasok dlya Morskikh Sudov, trans. of Lakakrasochne Materialy i Ikh Primenenie (USSR) n6 p53-6 1964.

Descriptors: (*Antifouling coatings, Model tests), (*Model tests, Antifouling coatings), (*Test methods, Antifouling coatings), Ships, Sea water, Life expectancy, Toxicity, USSR

The kinetics of the process whereby copper ions toxic for marine organisms are leached from antifouling coatings of KHV-53 and KHS-79 paints were studied. It was shown that this process takes place at differing temperatures, chlorion concentrations and leaching medium pH, and that it follows equal regular patterns for both paints; temperature, however, is the most important factor determining the leaching speed of copper from coatings. It is recommended that a fast method of determining the effectiveness of antifouling coatings be used employing a glycine solution; it is essential that the samples being tested be thermostatically controlled and rotated in the leaching medium. An improved quick method has been developed for determining the leaching speed of copper from antifouling coatings in a thermostatically controlled apparatus. This method is suitable for checking the efficiency of antifouling paints both when paint formulas and coating systems are being developed and when the quality of industrial output is being inspected. (Author)

**AD-628 196 Fld. 11/3, 13/10**
*DEPARTMENT OF THE NAVY WASHINGTON D C*
**AN INVESTIGATION OF COATINGS USED AS ANODE SCREENS IN CATHODIC PROTECTION (ISSLEDOVANIYE POKRYTIY DLYA PRIMENENIYA IKH V KACHESTVYE OKOLOANODYNKH EKRANOV PRI KATODNOY ZASHCHITYE),**
by V. P. Bardina, and L. A. Suprun. 1964, 13p.

Unclassified report

Proceedings of the Central Scientific-Research Inst. for the Merchant Marine, Issue 57, p23-36 1964.

Descriptors: (*Cathodic protection, Organic coatings), (*Organic coatings, Cathodic protection), (*Anodes, Organic coatings), Plastic coatings, Sea water, Electric currents, Paints, Epoxy coatings, Acrylic resins, Silicone plastics, Synthetic rubber, Ship hulls, USSR

The article cites the results of laboratory tests involving a series of non-metallic coverings in still and moving sea water during the simultaneous activity of an electric current at various voltages. On the basis of these experiments epoxy and ethynolene coatings are recommended for experimental use on vessels as anode screens in cathodic protection. (Author)

**AD-628 615** **See Fld. 22/2**

## 11/4. COMPOSITE MATERIALS

**AD-628 668 Fld. 11/4, 1/3, 13/13**
**CFSTI Prices: HC $1.00 MF $0.50**
*WHITTAKER CORP LOS ANGELES CLAIF*
**A SURVEY OF COMPOSITE MATERIALS AND STRUCTURES,**
by Bryan R. Noton. Sep 65, 21p. Rept. no. TM-16,

Unclassified report

Prepared for presentation at the 1965 Aerospace Development Briefings and Related Equipment Displays of the Air Force Association, Washington, D. C., September 15-17, 1965.

Descriptors: (*Composite materials, Reviews), (*Airframes, Composite materials), Reinforcing materials, Fibers, Sandwich construction, Ceramic materials, Radomes, Structures, Expandable structures, Cryogenics, Antennas, Spacecraft, Filament wound construction, Heat-resistant plastics, Rotary wings

Design concepts using alumina-tile segments for large ceramic structures and alumina 'Imidite' radomes with superior rain-erosion resistance, are covered. Selferecting, self-supporting, expandable aerospace structures for airlocks, interconnecting tunnels, etc. are included because of possible MOL applications. Efforts are pursued to reduce the cost of materials and structures. A method to automatically reproduce high-quality, reinforced

plastic structures, a 250F curing high-strength adhesive, and a low-temperature curing, dual-purpose, laminate requiring no adhesive, have thereby been developed. Cryogenic and heat-resitant adhesives and applications are further discussed. A variety of tailored thermal-insulating materials and applications is then covered. Future developments will concern multi-performance composites providing the structure, armor protection, and passive anti-radar. Among the precision structures manufactured, are the 'Telstar' horn and 'Tetrac' parabolic antennas, and the communications antenna on 'Mariner IV'. Numerous other components are mentioned. Using a 'multi-shell' concept, highly-reliable pneumatic pressure vessels are in production. Weight comparisons and cyclic fatigue values support the paper. A further specialty is the bonding of LEM and supersonic air-vehicle windows. The composite approach was necessary for cryogenic gasket problems. (Author)

## 11/5. FIBERS AND TEXTILES

**AD-628 050 See Fld. 13/13**

## 11/6. METALLURGY AND METALLOGRAPHY

**AD-628 085 Fld. 11/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*WISCONSIN UNIV MADISON*
**MECHANISM OF STRESS CORROSION CRACKING IN FACE-CENTERED-CUBIC METALS.**
Final technical rept.,
by R. A. Dodd. 1965, 5p. Contract AF-AFOSR-221-63,
AFOSR 65-2702
Unclassified report

Descriptors: (*Stress corrosion, Fracture (Mechanics)), (*Alloys, Stress corrosion), Copper alloys, Gold alloys, Platinum alloys, Palladium alloys, Stainless steel, Molybdenium alloys, Metallography

The work was designed firstly to examine the possibility of the existence of a universal mechanism of transgranular stress corrosion cracking, originally postulated by Robertson and Tetelman, and later, when such a mechanism was substantially disproved, to examine possible cracking mechanisms in various alloy systems of interest. The experimental techniques employed included the determination of times to complete fracture under stress corrosion conditions, potentiostatic studies of polarization phenomena, etc., and electron microscope investigations of dislocation configurations and estimates of the related stacking fault energies.

**AD-628 154 Fld. 11/6**
**CFSTI PricesMF $0.75**
*ILLINOIS UNIV URBANA DEPT OF CIVIL ENGINEERING*
**THE FATIGUE AND STATIC PROPERTIES OF BUTT WELDS IN STRUCTURAL STEELS,**
by L. A. Harris, and G. E. Nordmark. 30 Jun 54, 113p. Contract DA-33-017-eng-221,
Unclassified report

Prepared in cooperation with Ohio River Div. Labs., Mariemont.

*Availability: Available from Corps. of Engineers, Ohio River Div. Labs., Mariemont $1.50. CFSTI MF$0.75.*

Descriptors: (*Steel, Welds), (*Welds, Fatigue (Mechanics)), (*Fatigue (Mechanics), Arc welding), Statics, Loading (Mechanics), Fracture (Mechanics), Metal plates, Tests, Test methods

The report presents the results of the first phase of a study of full scale welded joints: a study of the fatigue and static properties of butt welds. The purpose of the tests reported were to compare the fatigue and static properties of butt welds produced with the E6010 and the E7016 electrodes. Two types of butt weld specimens were tested: the longitudinal butt welds were tested with the applied stress parallel to the direction of welding, whereas the transverse butt welds were tested with the applied stress perpendicular to the direction of welding. The butt welds have been tested either with the reinforcement on or with the reinforcement removed by grinding. The specimens were subjected to a stress cycle which varied from a low tension of about 2000 psi to a maximum tension which was of such magnitude that failure generally occurred between 100,000 and 2,000,000 cycles. In order to more thoroughly understand the behaviour of butt welds subjected to repeated stresses, an extensive review of the fatigue tests of butt welds conducted previously at the University of Illinois is included in the report.

**AD-628 155 Fld. 11/6**
*CANADIAN ARMAMENT RESEARCH AND DEVELOPMENT ESTABLISHMENT VALCARTIER (QUEBEC)*
**THE HEAT-TREATABILITY AND PROPERTIES OF URANIUM ALLOYS,**
by H. P. Tardif. 1964, 11p.
Unclassified report

*Availability: Published in The Canadian Mining and Metallurgical Bulletin Transactions v68 p332-42 Nov 1965. Copies to DDC users only.*

Descriptors: (*Uranium alloys, Heat-treatment), (*Physical properties, Uranium alloys), Hardness, Processing, Corrosion, Molybdenum alloys, Canada

Some possible applications of uranium and its alloys in the non-nuclear field are surveyed and the general characteristics of uranium are reviewed. The metallurgy of the pure metal and of its alloys and the general principles of alloying and heat-treatment of uranium are then described. Alloys of uranium with various alloying elements were obtained from other agencies, and their response to heat-treatment determined by means of simple hardness tests. Some of the more promising alloys were heat-treated in larger quantities, and their compression, tensile, bend and impact properties were determined. The corrosion properties of these alloys were also determined. Although more fundamental work remains to be done, it appears that high-density, high-strength uranium alloys can be developed with success. (Author)

**AD-628 156 Fld. 11/6, 13/2**
**CFSTI PricesMF $0.75**
*ILLINOIS UNIV URBANA DEPT OF CIVIL ENGINEERING*
**FERROUS ARC WELDING. PART I. A CORRELATION OF THE LITERATURE ON WELDABILITY.**
Rept. on Welding Tests on Structural and Rail Steel.
Jul 51, 75p. Contract DA-33-017-eng-34,
Unclassified report

*Availability: Ohio River Div. Labs., Mariemont, Ohio. HC $1.00, CFSTI MF $0.75.*

Descriptors: (*Arc welding, Steel), (*Weldability, Steel), (*Steel, Weldability), Transition temperature, Hydrogen, Stresses, Test methods

Chapter II presents a brief discussion of the arc welding process. Chapter III considers the variables affecting the weldability of plain-carbon, low-alloy, and high-alloy steels. Chapter IV is concerned with the importance of the transition temperature of a material and with the ensuing complications of welding. Included is a discussion of the correlation of many of the test methods used to determine transition temperature. Chapter V contains a discussion of the effects of hydrogen and other gases and of the methods for their control. The methods of analysis and the determination of the quantities of gases present in a weld are briefly surveyed. Chapter VI discusses the importance, magnitude, and relief of residual stress in weldments. Included is a discussion of the interaction of residual stress and hydrogen, which is one of the principal objectives in a current experimental program now being conducted at the University of Illinois. Appendix A presents a summary and discussion of the replies to the questionnaire distributed by the Corps of Engineers. Appendix B contains the bibliography.

**AD-628 277 Fld. 11/6**
**CFSTI Prices: HC $1.60 MF $0.50**
*NAVAL RESEARCH LAB WASHINGTON DC*
**FRACTOGRAPHIC ANALYSIS OF TI-7AL-2CB-1TA AND TI-6AL-4V FRACTURES DEVELOPED IN 'WET' FATIGUE.**
Interim rept.,
by R. W. Judy Jr., T. W. Crooker, R. E. Morey, E. A. Lange, and R. J. Goode. 14 Jan 66, 20p.
Rept. no. NRL-6330,
Proj. SF-020-01-01-0724 ,SF-020-01-05-0731
Unclassified report

Descriptors: (*Titanium alloys, Fatigue (Mechanics)), (*Fracture (Mechanics), Titanium alloys), Strain (Mechanics), Yield point, Stress corrosion, Fractography, Water, Air

Crack-growth-rate studies on Ti-7Al-2Cb-1Ta and Ti-6Al-4V alloys in low-cycle fatigue were performed in air and in a 3.5-percent salt-water solution. The Ti-7Al-2Cb-1Ta alloy was additionally tested in distilled water. An increase in crack-growth rate at all strain ranges was observed for the Ti-7Al-2Cb-1Ta in the 'wet' environments over that in the 'dry', whereas the Ti-6Al-4V alloys did not appear to be sensitive to a 'wet' environment. At a strain range of 8000 to 9000 microinches/inch, corresponding to about 60-percent yield strength, the crack-growth rate of Ti-7Al-2Cb-1Ta alloy accelerated and became erratic. Fractographic studies show that the increase in crack-growth rate is due to a change from the ductile mode of fatigue fracture usually found in 'dry' low-cycle fatigue tests of titanium alloys, to the brittle quasi-cleavage mode of fracture-a fracture mechanism of stress-corrosion cracking. The amount of quasi-cleavage seen on the fatigued fracture surface generally corresponds to the crack-growth-rate increase; thus, it is indicative of the degree of stress-corrosion cracking sensitivity. (Author)

**AD-628 284 Fld. 11/6, 13/8**
**CFSTI Prices: HC $28.70 MF $1.50**
*ILLINOIS UNIV URBANA DEPT OF CIVIL ENGINEERING*
**FERROUS ARC WELDING. PART II, SELECTED ABSTRACTS FROM THE LITERATURE.**
Rept. on Welding Tests on Structural and Rail Steel,
by L. A. Harris, and W. C. Hoeltje Jr., Jul 51, 291p. Contract DA-33-017-eng-34,
Unclassified report

Prepared in cooperation with Ohio River Div. Labs., Mariemont.

Descriptors: (*Arc welding, Bibliographies), (*Steel, Arc welding), Abstracts, Tests, Test methods, Welds, Hydrogen, Weldability, Stainless steel, Stresses, Electrodes, Strength, Fracture (Mechanics), Ductility, Transition temperature

**AD-628 387 Fld. 11/6, 11/2**
**CFSTI Prices: HC $4.60 MF $0.50**
*CASE INST OF TECH CLEVELAND OHIO DEPT OF METALLURGY*
**AN INVESTIGATION OF THERMAL AND MECHANICAL STABILITY OF MOLD MATERIALS FOR STEEL CASTINGS.**

Interim technical rept., 27 Jun 64-30 Jun 65, 30 Jun 65, 45p. Contract DA-33-019-AMC-270 (Z), Proj. DA-1A02440A110, AMRA CR-64-03/2

Unclassified report

See also AD-611 799.

Descriptors: (*Steel, Casting), (*Molding materials, Thermal stability), (*Tensile properties, Molding materials), Surface properties, Castings, Refractory materials, Binders, Zirconium compounds, Sand, Composite materials, Aluminum compounds, Silicon compounds, Oxides, Sodium compounds, Silicates, Moldings, Deformation

A test apparatus was developed to measure the tensile strength of molding materials at elevated temperatures. The measurements of tensile strength obtained from this equipment permits a qualitative evaluation of the ability of a mold to maintain casting dimensions. Several rammed mold materials consisting of various combinations of refractory aggregates and binders were investigated for use in producing high quality steel castings. The aggregates selected for study included mullite, zircon, silica sand, fused silica, olivine, and calcined alumina. These were bonded with western bentonite and sodium silicate. Close dimensional control was obtained with all aggregates bonded with sodium silicate and with the zircon and mullite aggregates bonded with western bentonite. The casting surfaces obtained with the fused silica and zircon were generally superior to those produced in other aggregates. (Author)

**AD-628 514 Fld. 11/6, 20/2**
**CFSTI Prices: HC $1.10 MF $0.50**
*NORTHWESTERN UNIV EVANSTON ILL DEPT OF MATERIALS SCIENCE*
**SOME OBSERVATIONS ON SHOCK-LOADED COPPER.**
Technical rept.,
by Jerome E. Cohen, Al Nelson, and Robert J. De Angelis. 20 Sep 65, 7p. Rept. no. TR-8, Contract Nonr-1228 (20), Proj. NR-031-680,

Unclassified report

Descriptors: (*Copper, Loading (Mechanics)), (*Shock (Mechanics), Copper), (*Twinning (Crystallography), Copper), Recrystallization, Shear stresses, Grain structures (Metallurgy)

It is shown that if partial dislocations are involved in twinning in shock-loaded Cu, these must be intrinsic. The twinning shear was measured directly and found to agree with theory. Recrystallization starts at twin intersections and sweeps along the (incoherent) interfaces before advancing into the matrix. (Author)

**AD-628 538 Fld. 11/6, 14/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*SPRINGFIELD ARMORY MASS*
**INVESTIGATION OF SONIC TECHNIQUES FOR THE NONDESTRUCTIVE EVALUATION OF SINTERED IRON POWDER COMPACTS.**
Technical rept.,
by R. H. Brockelman. 28 Jan 66, 43p. Rept. no. SA-TR19-1515,
Proj. DA-AW-4-05001,

Unclassified report

Descriptors: (*Iron, Powder metals), (*Powder metals, Non-destructive testing), (*Non-destructive testing, Powder metals), (*Ultrasonic radiation, Non-destructive testing), Sound, Propagation, Tensile properties, Porosity, Resonance, Attenuation, Microstructure

Work relative to the development of nondestructive testing techniques for the inspection of sintered metal powder components is described. This study was necessitated by the fact that the major criteria for evaluation of sintered metal powder components, i.e., composition and density, do not alone adequately insure quality or performance in applications where high strength and reliability are needed. The work described is concerned with the sonic testing of sintered electrolytic iron powder compacts. Ultrasonic and resonance techniques were utilized to investigate such factors as sound velocity and attenuation, resonant frequency, and damping capacity. These data were then correlated with processing variables, strength properties, and microstructure. (Author)

**AD-628 646 Fld. 11/6**
*NORTH CAROLINA STATE UNIV RALEIGH*
**DIE KOBALTREICHEN LEGIERUNGEN IM DREISTOFFSYSTEM KOBALT-ANTIMON-BOR,**
by G. Hofer, and H. H. Stadelmaier. 1965, 2p. Contract DA-31-124-ARO (D)-277, AROD 5010:5

Unclassified report

Text in German.

*Availability: Published in Metall, v12 p1257-8 Jan 19 1965. Copies to DDC users only.*

Descriptors: (*Cobalt alloys, Phase studies), Antimony alloys, Boron alloys, Grain structures (Metallurgy), Crystal lattices

Das Dreistoffsystem Kobalt-Antimon-Bor ist in der Kobaltecke bis zu 50 At.-% Antimon und 35 At.-% Boran Hand einer Schmelzflachenprojektion und eines isothermen Schnittes bei 800C untersucht worden. Das System zeichnet sich durch eine Mischungslucke im flussigen Zustand sowie eine inkongruent schmelzende ternare Phase mit Chromkarbid (Cr23C6)-Struktur aus. Die Zusammensetzung des ternaren Borides betragt Co74.5Sb4B21.5 oder angenahert o22Sb1B6. Seine Gitterkonstante nimmt mit zunehmendem Antimongehalt zu und hat einen Mindestwert von 10.54 (0)A sowie einen Hochstwert von 10.59 (6)A. (Author)

**AD-628 648 Fld. 11/6**
*ILLINOIS UNIV URBANA*
**BETA-MANGANESE PHASES IN TERNARY SYSTEMS OF TRANSITION ELEMENTS WITH SILICON, GERMANIUM, OR TIN,**
by D. I. Bardos, R. K. Malik, F. X. Spiegel, and Paul A. Beck. 17 May 65, 9p. Contract DA-ARO (D)-31-124-G609, AROD 5103:3

Unclassified report

*Availability: Published in Transactions of the Metallurgical Society of AIME, v236 p40-8 Jan 1966. Copies to DDC users only.*

Descriptors: (*Manganese alloys, Phase studies), (*Phase studies, Manganese alloys), Transition elements, Tin alloys, Silicon alloys, Germanium alloys, Metallography, X-ray diffraction analysis

Study of the occurrence of elongated beta-Mn phase fields and of their direction of extension in fifteen ternary systems indicates that the beta-Mn phases formed by manganese with other transition elements and with either silicon, germanium, or tin may be considered as electron phases. In these phases the alloying behavior of silicon on the one hand and of germanium and tin on the other shows a significant difference. Formally all observations can be satisfactorily described by attributing to germanium and tin an apparent electron concentration of nine electrons per atom. This behavior may be interpreted by assuming that germanium and tin exclude itinerate electrons because of a strong repulsive potential arising from the requirement that their wave functions be orthogonal to those of the closed d shells of these atoms. The absence of a d shell in silicon allows this atom to admit itinerate d electrons. The following new ternary phases of unknown structure were identified by means of their X-ray diffraction patterns: (Mn, Co, Si)I, (Mn, Co, Si)Y, (Mn, Co, Si)Q, (Mn, Ni, Si)W, and (Mn, Ti, Si)A. The X-ray data suggest that these phases have large unit cells and that to some extent they may be related structurally to the sigma phase. (Author)

**AD-628 649 Fld. 11/6**
*ARGONNE NATIONAL LAB ILL*
**ELECTRON PHASES IN CERTAIN TERNARY ALLOYS OF TRANSITION METALS WITH SILICON,**
by D. I. Bardos, and Paul A. Beck. 3 Aug 65, 6p. Contract DA-ARO (D)-31-124-G609, AROD 5103:5

Unclassified report

*Availability: Published in Transactions of the Metallurgical Society of AIME v236 p64-9 Jan 1966. Copies to DDC users only.*

Descriptors: (*Silicon alloys, Phase studies), (*Atomic orbitals, Silicon alloys), Electrons, Vanadium alloys, Iron alloys, Cobalt alloys, Nickel alloys, Manganese alloys, Chromium alloys, Thermodynamics, X-ray diffraction analysis, Transition elements

The 1100C isothermal sections of the V-Fe-Si, V-Co-Si, and V-Ni-Si systems were studied at silicon contents between 0 and 40 at. pct. The single-phase fields in the 30 and 50 at. pct Mn sections of the 1100C tetrahedron of the V-Mn-Fe-Si system were also determined. The direction of extension of the elongated sigma, R, D, and alphaMn phase fields suggests that the stability of these phases is determined largely by the electron concentration. The peculiar shape of the above ternary sigma phase fields, as well as of the sigma phase field s in the V-Mn-Si and Cr-Mn-Si systems is accounted for on the assumption that in manganese (iron-, cobalt-, nickel-) rich alloys silicon atoms do not exclude d electrons, while in alloys low in the above components they do. This assumption also leads to the expected electron concentrations for sigma and beta-Mn phases formed by transition metals with aluminum. (Author)

**AD-628 794 Fld. 11/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*MARTIN CO BALTIMORE MD*
**EFFECT OF VACUUM ON THE MECHANICAL BEHAVIOR OF METALS.**
Final rept., 1 Oct 64-1 Oct 65,
by I. R. Kramer, and H. Shen. Oct 65, 20p. Rept. no. RR-70, Contract AF 49 (638)-1455, Proj. AF-9782, Task 978202, AFOSR 66-0007

Unclassified report

Descriptors: (*Metals, Vacuum), (*Vacuum, Metals), Mechanical properties, Aluminum alloys, Iron, Molybdenum, Tensile properties, Fatigue (Mechanics), Stresses

The fatigue life of Aluminum 1100 has been studied as a function of pressure, stress, frequency, and temperature. The data indicate that the amount of fatigue improvement and the frequency effect observed in vacuum decrease with increasing stress amplitude. The results of resonant frequency measurements, showing the correlation of the fatigue improvement and the frequency effect with the rate of change in the resonant frequency, suggest a possible new method to detect the rate of damage formation for fatigue studies. Iron has been used for studying the various effects of vacuum on BCC metals. Results reveal that vacuum has greater effect on the fatigue life of iron than on the fatigue life of aliminum. As for the tensile studies, the stress-strain curves of iron and recrystallized molybdenum wire specimens have been studied in vacuum. It is found that in the case of iron, only the stress at the Luders' band region is subject to the effect of vacuum. However, the amount of change is dependent on the strain rate. When a very slow strain rate, 9 x 10 to the minus

7th power/sec, is used, the decrease may amount to as much as 1200 psi. The effects of vacuum on the ultimate tensile stress and the total elongation of molybdenum at high temperatures are attributed to a decrease in the rate of oxidation. (Author)

**AD-628 865 Fld. 11/6, 20/11, 14/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*COLORADO SCHOOL OF MINES RESEARCH FOUNDATION INC GOLDEN*
**THE MECHANICAL PROPERTIES OF COPPER AT HIGH STRAIN RATES. VOLUME I. THE EFFECT OF STRAIN RATE ON THE FLOW STRESS OF COPPER.**
Technical rept., 1 May 63-28 Feb 65,
by J. D. Lubahn, R. C. Culver, and R. L. Straw.
Feb 66, 48p. Contract AF 29(601)-6042. Proj. AF-7811, Task 781105,
AFWL TR-65-121-Vol-1
Unclassified report

Descriptors: (*Copper, Stresses), (*Stresses, Copper), Strain (Mechanics), Mechanical properties, Impact tests, Impact shock, Shock Waves, Propagation

An experimental method of determining dynamic flow stress where the stress is homogeneous is developed using a pendulum bar suspension system. A small specimen is mounted on the end of one of the bars and the other bar is impacted on the free and of the specimen. For copper, the dynamic stress is 29% larger than the static stress for a strain rate of about 100/sec (or an increase in strain rate of about 5 orders of magnitude). For various tests, the increase in dynamic stress over the static value varied from 17% to 45%. This variation is comparable with the expected scatter for a typical test (plus or minus 10%) predicted from the uncertainties in measurement. (Author)

**AD-628 190 See Fld. 20/12**

**AD-628 251 See Fld. 7/4**

**AD-628 398 See Fld. 20/11**

**AD-628 491 See Fld. 20/11**

**AD-628 515 See Fld. 11/2**

**AD-628 856 See Fld. 20/11**

## 11/7. MISCELLANEOUS MATERIALS

**AD-628 064 Fld. 11/7, 13/8, 13/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*SOUTHWEST RESEARCH INST SAN ANTONIO TEX*
**DEVELOPMENT OF EQUIPMENT AND PROCEDURES FOR PRODUCING LARGE QUANTITIES OF FOAMED SULPHUR IN THE FIELD.**
Rept. for 1 Jun 64-3 Jun 65,
by John M. Dale, and Allen C. Ludwig. Jan 66, 24p. Contract AF 29(601)-6408. Proj. AF-5710, Task 13.157,
AFWL TR-65-71
Unclassified report

Descriptors: (*Foams, Sulfur), (*Sulfur, Foams), Underground structures, Shock absorbers, Costs, Feasibility studies, Machines, Design, Manufacturing methods

Work performed under this contract represents the first practical development of a process and equipment for producing large quantities of rigid sulphur foam. It was demonstrated that foamed sulphur can indeed be produced on a continuous basis at a remote field site by a process and with equipment that is simple and capable of being scaled up to any size. The foam prepared using the procedures and equipment developed here in has mechanical properties comparable to that produced on a batch basis in the preceding laboratory study--namely a density of 27 lb/cubic ft, a compressive strength of 130 psi, a constant strain rate deformation to 65-70 percent, and a low water absorption. Since the cost of the raw materials for hese sulphur foams is less than two cents per pound, a foam with a density of 27 lb/cu ft can be produced for only $0.54 per cubic foot. Conventional foams with similar physical properties that can be produced at a remote field site are the rigid urethane foams. The comparative cost of a urethane foam having a compressive strength of 125 psi is approximately $3.00 per cubic foot. During the week of 17 January 1965, the feasibility of producing foamed sulphur in the field was demonstrated for the Air Force at Kirtland Air Force Base, Albuquerque, New Mexico, by filling a 30-cubic foot annular space with rigid foamed sulphur.

## 11/8. OILS, LUBRICANTS, AND HYDRAULIC FLUIDS

**AD-628 073 Fld. 11/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV*
**EFFECT OF WATER AND PARTICULATE CONTAMINATES ON POLYMER SHEAR STABILITY.**
Technical rept.,
by Ralph L. LeMar. Jan 66, 19p. Proj. DA-1C024401A108,
RIA 66-208
Unclassified report

Descriptors: (*Hydraulic fluids, Additives), (*Polymers, Stability), Polyethylene plastics, Acrylic resins, Impurities, Water, Particles, Ultrasonic radiation, Contamination, Viscosity

Polyisobutylene and polymethacrylate viscosity index improver additives were tested in oil solution for shear stability by the sonic irradiation technique, with and without added water and solid particle contaminants. The shear breakdown of polyisobutylene was significantly reduced at low water concentrations and nearly completely blocked at high water concentrations. The shear stability of the polymethacrylate solutions was not significantly affected by water. Neither polymer's stability was affected by particulate contamination. It was concluded that sonic shear methods may be used in the presence of solid particle contaminants and in the presence of water contaminants for shear stability determinations on polymethacrylate-oil solutions. Insofar as sonic shear methods reflect shear stresses on hydraulic oils, these results indicate that such contaminants would not adversely affect polymer shear stability at the low concentration levels normally found in such oils. (Author)

**AD-628 446 Fld. 11/8, 1/3**
**CFSTI Prices: HC $2.60 MF $0.50**
*SHELL OIL CO WOOD RIVER ILL RESEARCH LAB*
**STUDY OF HELICOPTER GEAR LUBRICATION.**
Quarterly progress rept. no. 3, Sep-Nov 65,
by D. R. Bailey, and S. J. Beaubien. Nov 65, 22p. Contract NOw-65-0323-c,
Unclassified report

See also AD-621 916.

Descriptors: (*Helicopters, Gears), (*Lubrication, Gears), (*Gears, Lubrication), Protective treatments, Coatings, Additives, Lubricants, Heat treatment, Hardness, Polishing, Fatigue (Mechanics), Life expectancy, Failure (Mechanics)

The report contains results of investigations along two lines: (1) studies of the effects of pretreatments on the fatigue life of gears, and (2) exploratory tests to determine the effects of extreme pressure (EP) additives on the mechanisms of surface damage, particularly fatigue pitting, in sliding and rolling contacts. The pretreatments include the application of precoatings, polishing to reduce surface roughness, and tempering hardened gears to give a range of hardnesses. All gear tests were conducted at a pinion speed of 1600 rpm.

**AD-628 838 Fld. 11/8, 13/10**
**CFSTI Prices: HC $4.60 MF $0.50**
*NAVY MARINE ENGINEERING LAB ANNAPOLIS MD*
**VAPOR-SPACE-CORROSION INHIBITED OILS FOR USE IN STEAM-TURBINE LUBRICATING SYSTEMS.**
Research and development phase rept.,
by Ronald P. Layne. Feb 66, 44p. Rept. no. MEL-21-66,
Proj. S-F020-03-05, Task 0601,
Unclassified report

Descriptors: (*Steam turbines, Lubrication), (*Lubricants, Corrosion inhibition), Oils, Lubricant additives, Marine propulsion, Performance (Engineering), Compalibility, Corrosion

Incorporating vapor-space-corrosion inhibitors in operating steam-turbine oils has been shown by laboratory experiments to be feasible. Two oils appear suitable for use in steam-turbine lubricating systems. Further confirmatory testing of side effects is underway. (Author)

**AD-628 131 See Fld. 9/1**

**AD-628 673 See Fld. 21/4**

## 11/9. PLASTICS

**AD-628 079 Fld. 11/9**
**CFSTI Prices: HC $2.00 MF $0.50**
*UNITED STATES RUBBER CO WAYNE N J RESEARCH CENTER*
**PHOSPHONITRILIC POLYMERS STABLE AT HIGH TEMPERATURES.**
Final rept. 1 Nov 64-31 Oct 65,
by Douglas I. Relyea, Gerald J. Klender, and Aspet Merijanian. Jan 66, 48p. Contract NObs-92060, Proj. SR-007-03-03 Task 1000,
Unclassified report

Continuation of Contracts NObs-88232, NObs-90089.

Descriptors: (*Heat-resistant plastics, Phosphonitrile chlorides), (*Electrical insulation, Phosphonitrile chlorides), (*Phosphonitrile chlorides, Polymerization), (*Organoboranes, Copolymerization), Synthesis (Chemistry), Organic phosphorus compounds, Glycols, Thermogravimetric analysis, Organic solvents, Phenols, Molecular isomerism

The objective of the investigation was the development of new thermoplastic and thermosetting resins from phosphonitrilic chloride trimer for high temperature electrical applications. The preparation of the tetraphenoxydichlorophosphonitrile trimer (I) was scaled up to yield a total of thirty pounds of this monomer. A soluble P-O-P linked polymer of I was obtained and found to be stable to 317C. The P-O-P linked polymer in which the theoretical repeating unit is -P3N3 (OC6H5)4O- appears slightly more stable than the polymer with the theoretical repeating unit -P3N3 (C6H5)2 (OC6H5)2O-. Monomer I was reacted with several aromatic diols and the resulting polymers examined by thermogravimetric analysis. Polar solvents accelerate the reaction of P3N3Cl6 and hydroquinone at 80C. A soluble polymer of MW>6000 was prepared from P3N3 (OC6H5)4Cl2 and disodiobisphenol A. Fire-retardant (self-extinguishing) glass cloth laminates were prepared from both P-O-P and bisphenol A- linked polymers. (Author)



211-792 O-66-5

**AD-628 399 Fld. 11/9, 13/8**
**CFSTI Prices: HC $7.60 MF $0.75**
*BUREAU OF SHIPS WASHINGTON D C*
**WELDING OF POLYMER FILMS,**
by L. N. Matsyuk, A. V. Bogdashevskii, L. K.Zharova, Yu. M. Kolobkov, and O. A. Kotovshchikova. Feb 66, 74p. Rept. no. TRANS-968,
TT 66-60599
Unclassified report

Trans. of mono. Svarka Polimernykh Plenok, Moscow, 1965 80p.

Descriptors: (*Polymers, Films), (*Films, Joining), (*Diffusion bonding, Films), Processing, Heating elements, Ultrasonic radiation, Infrared radiation, Friction, Electric currents, High-frequency, Thermoplastics, Halocarbon plastics, Polyethylene plastics, Polyvinyl chloride, Polyamide plastics

In the brochure, the authors review the modern methods of welding polymer films: by contact heating, gaseous heat carriers, infrared radiation, ultrasonics, and by high frequency currents. Attention is given to the technology of welding various films. Recommendations are made on the selection of the methods of welding, on welding equipment, and optimal conditions. The material is a generalization of the studies on the technology of welding polymer materials, conducted under the supervision of L. N. Matsyuk in the period from 1958 to 1963. Certain of these studies have been widely adopted in industry. (Author)

**AD-628 503 Fld. 11/9, 20/6, 20/2**
**CFSTI Prices: HC $3.60 MF $0.50**
*MASSACHUSETTS UNIV AMHERST POLYMER RESEARCH INST*
**CALCULATION OF CRYSTAL BIREFRINGENCE AND INFRARED DICHROISM IN POLYMERIC SAMPLES FROM X-RAY POLE FIGURE DATA.**
Technical rept.,
by C. R. Desper. 15 Oct 65, 31p. Rept. no. ONR-TR-82,
Contract Nonr-3357 (01), Proj. NR-056-378,
Unclassified report

Descriptors: (*Polymers, Optical properties), (*Refraction, Polymers), (*Infrared phenomena, Polymers), Crystal structure, X-ray diffraction analysis, Graphics, Polyethylene plastics, Films, Mathematical analysis

In biaxially oriented polymer films, crystal orientation may be characterized by orientation functions evaluated from x-ray pole figure scans for various crystallographic planes. From such orientation functions, one may calculate the crystal contributions to birefringence and infrared dichroism. In addition, the relationships between orientation functions for various hkl planes are considered. The results are dependent upon the symmetry of the unit cell: in the orthorhombic system, the orientation functions for any crystallographic plane may be calculated from experimental values for two planes, while in the hexagonal or tetragonal systems, data on one plane will suffice. Finally, a method for graphical plotting of orientation functions in triangular coordinates is presented. This method has two advantages: a clear, simple visualization of the orientation functions is provided, for both uniaxial and biaxial orientation; and the relationships between the orientation functions for different crystallographic planes may be expressed in terms of simple geometrical constructions. (Author)

**AD-628 537 Fld. 11/9, 9/1**
**CFSTI Prices: HC $2.60 MF $0.50**
*HARRY DIAMOND LABS WASHINGTON D C*
**LOW-LOSS STYRENE-TYPE FOAM-IN-PLACE ENCAPSULATING RESINS,**
by F. J. O. Engelhardt. 15 Oct 65, 24p. Rept. no. TR-1308,
Proj. DA-1P523801A300, HDL-96300
Unclassified report

Descriptors: (*Encapsulation, Styrene plastics), (*Styrene plastics, Encapsulation), (*Expanded plastics, Encapsulation), Styrenes, Propellants, Polymerization, Powders, Dielectric properties, Radiofrequency, Compressive properties, Density

Low-dielectric-loss styrene-type foam-in-place encapsulating resins are not available commercially. Such a resin has now been developed. A propellant was added to the catalyzed styrene-polystyrene mixture; as the temperature of the polymerizing resin rose, the propellant expanded the resin into a cellular structure. Homogeneous foams were obtained in the presence of finely powdered polymers, which acted as bubble nucleators. The resultant rigid foams had dielectric constants ranging from 1.2 to 1.8, and loss tangents from 0.0002 to 0.001 over the frequency range 102 and 108 cps. Some of these materials had remarkably flat loss-frequency curves, losses ranging only between 0.0004 and 0.0005 over the same frequency range. Densities were varied between 0.194 and 0.850 g/cu cm, or between 12 and 53 lb/cu ft. These data indicate the usefulness of the new cellular materials as rf encapsulating resins. (Author)

**AD-628 675 Fld. 11/9, 1/3**
**CFSTI Prices: HC $7.60 MF $0.75**
*MISSISSIPPI STATE UNIV STATE COLLEGE DEPT OF AEROPHYSICS*
**A PRELIMINARY STUDY TO DETERMINE THE FEASIBILITY OF REINFORCED PLASTIC COLUMN MEMBERS FOR AIRCRAFT STRUCTURES.**
Research rept.,
by Dev R. Bhandari. Dec 65, 75p. Rept. no. Aerophysics RR-60,
Contract DA-44-177-AMC-892 (T) Task 1P125901A14203,
USAAVLABS Tr-65-76
Unclassified report

Descriptors: (*Plastics, Airframes), (*Laminated plastics, Airframes), (*Airframes, Plastics), Aircraft, Structural properties, Reinforcing materials, Glass textiles, Buckling (Mechanics), Mathematical analysis

Empirical formulas for predicting the critical buckling stress of fiber glass reinforced plastic columns have been obtained. On the basis of these buckling formulas, structural efficiency of fiber glass reinforced plastic column members of different cross sections is compared with other commonly used structural alloys. The efficiency parameter used for comparison is derived on the minimum weight design considerations. (Author)

**AD-628 681 Fld. 11/9, 1/3**
**CFSTI Prices: HC $12.60 MF $1.00**
*HAYES INTERNATIONAL CORP BIRMINGHAM ALA*
**REINFORCED PLASTIC LANDING GEAR FOR UH-1 HELICOPTER.**
Final rept.,
by Leon R. Anderson, and Robert D. Holmes. Jan 66, 127p. Rept. no. 1188,
Contract DA-44-177-AMC-120 (T), Task DA-1D121401A14176,
USAAVLABS TR-66-3
Unclassified report

Descriptors: (*Helicopters, Landing gear), (*Landing gear, Helicopters), (*Plastics, Landing gear), Glass textiles, Reinforcing materials, Aircraft, Structural parts, Filament wound construction, Performance (Engineering), Experimental data

The primary objective of this program was to determine the feasibility of using reinforced plastic material for helicopter landing gears. A comprehensive design study was made, a fiber glass reinforced plastic landing gear system for the UH-1 helicopter was fabricated, and a full scale item was subjected to static and drop tests. Materials used for fabrication were Owens Corning S-994 HTS 901 twelve end glass roving and Union Carbide ER-2270 epoxy resin with methylnadic anhydride. Fabrication was accomplished by Cincinnati Testing Laboratories (CTL) by a wet winding process. Final design was based on the following properties: Flexural Strength = 183,000 psi; Interlaminar Shear Strength 7,000 psi; Compressive Strength = 110,000 psi; Flexural Modulus = 8 x 10 (6) psi. The static and drop tests demonsated a high degree of ruggedness and durability. One of the two reinforced plastic members of the landing gear systems was subjected to four ultimate design static tests and fifteen drop tests without damage or failure. The other member was subjected to all tests except one of the static tests. (Author)

**AD-628 097** **See Fld. 13/10**

**AD-628 301** **See Fld. 7/5**

**AD-628 496** **See Fld. 9/2**

**AD-628 685** **See Fld. 20/4**

**AD-628 686** **See Fld. 20/4**

**AD-628 715** **See Fld. 20/11**

**AD-628 716** **See Fld. 20/11**

## 11/11. SOLVENTS, CLEANERS AND ABRASIVES

**AD-628 718 Fld. 11/11**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MECHANICAL ENGINEERING*
**EFFECT OF ABRASIVE PARTICLE SIZE ON WEAR,**
by E. Rabinowicz, and A. Mutis. 8 Feb 65, 10p.
Contract DA-31-124-ARO (D)-143,
AROD 4266:1
Unclassified report

*Availability: Published in Wear, v8 p381-90 1965. Copies to DDC users only.*

Descriptors: (*Abrasives, Particle size), Corrosion, Adhesion, Friction, Metals, Wear resistance, Copper, Nylon

Previous experiments have shown that, for any system, there exists a minimum abrasive particle size which allows maximum abrasive action. It is suggested that this critical abrasive size corresponds to the size of adhesive wear fragments of the material being abraded. Experiments with lubricated copper and nylon surfaces show reasonably good agreement between the postulated and measured critical abrasive sizes. Disturbing effects, such as severe adhesive wear and take-up of abrasive during sliding, are discussed. (Author)

## 11/12. WOOD AND PAPER PRODUCTS

**AD-628 545** **See Fld. 13/13**

# Field 12-MATHEMATICAL SCIENCES

## 12/1. MATHEMATICS AND STATISTICS

**AD-628 088 Fld. 12/1**
*WISCONSIN UNIV MADISON*
**PERTURBATIONS OF A NONLINEAR VOLTERRA EQUATION,**
by J. J. Levin, and J. A. Nohel. 11 May 65, 18p.
Contract DA-31-124-ARO (D)-266,
AROD 4936:1
Unclassified report

*Availability: Published in Michigan Mathematical Journal v12 p431-47 1965. Copies to DDC users only.*

Descriptors: (*Integral equations, Perturbation theory), (*Perturbation theory, Integral equations)

**AD-628 090 Fld. 12/1**
*WASHINGTON UNIV ST LOUIS MO*
**A NOTE ON INDEFINITE INTEGRALS,**
by Mitchell H. Taibleson. 9 Jul 64, 4p. Contract DA-31-124-ARO (D)-58,
AROD 3076:8

Unclassified report

*Availability: Published in Proceedings of the American Mathematical Society v16 n5 p923-5 Oct 1965. Copies to DDC users only.*

Descriptors: (*Integrals, Functions), (*Functions, Integrals), Distribution theory, Fourier analysis, Series

**AD-628 091 Fld. 12/1, 7/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARO INC TULLAHOMA TENN*
**NUMERICAL INTEGRATION OF FIRST-ORDER STIFF DIFFERENTIAL EQUATIONS.**
Technical rept.,
by F. C. Loper, and W. J. Phares. Feb 66, 19p.
Contract AF40 (600)-1200, Proj. AF-6951,
Task 695102,
AEDC TR-65-262

Unclassified report

Descriptors: (*Integration, Differential equations), (*Differential equations, Integration), Numerical methods + procedures, Transformations (Mathematics), Reaction kinetics, Nonlinear differential equations

A method is presented for numerically integrating a system of stiff, first-order differential equations. This method is based on transforming the set of dependent variables so that the resulting system will not be stiff; the transformed system is then integrated by the Runge-Kutta method. The resulting procedure is often appreciably faster than classical methods in that a much larger step size is allowable with nominal increase in step computation time. Applications and results are discussed for systems of various order, including a system of six chemical rate equations. (Author)

**AD-628 094 Fld. 12/1**
*HARVARD UNIV CAMBRIDGE MASS*
**THE SHILOV BOUNDARY OF THE ALGEBRA OF MEASURES ON A GROUP,**
by Joseph L. Taylor. 28 Sep 64, 6p. Contract DA-31-124-ARO (D)-128,
AROD 1617:55

Unclassified report

*Availability: Published in Proceedings of the American Mathematical Society v16 n5 p941-5 Oct 1965. Copies to DDC users only.*

Descriptors: (*Measure theory, Algebraic topology), (*Algebraic topology, Measure theory), Groups (Mathematics), Algebras

**AD-628 103 Fld. 12/1**
*HARVARD UNIV CAMBRIDGE MASS*
**THE STRUCTURE OF CONVOLUTION MEASURE ALGEBRAS,**
by Joseph L. Taylor. 1 Aug 64, 19p. Contract DA-31-124-ARO (D)-128,
AROD 1617:56

Unclassified report

Prepared in cooperation with Louisiana State Univ., Baton Rouge.

*Availability: Published in Transactions of the American Mathematical Society v119 n1 Issue 7 p150-66 Jul 1965. Copies to DDC users only.*

Descriptors: (*Measure theory, Algebras), (*Algebraic topology, Measure theory), Functional analysis, Groups (Mathematics)

The report concerns the maximal ideal space of the convolution measure algebra on a compact group.

**AD-628 104 Fld. 12/1**
*HARVARD UNIV CAMBRIDGE MASS*
**DIMENSION THEORY IN COMPLETE ORTHOCOMPLEMENTED WEAKLY MODULAR LATTICES,**
by Arlan Ramsay. 30 Aug 63, 24p. Contract DA-31-124-ARO (D)-128,
AROD 1617:58

Unclassified report

Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge.

*Availability: Published in Transactions of the American Mathematical Society, v116 Issue 4 p9-31 Apr 1965. Copies to DDC users only.*

Descriptors: (*Algebra, Theory)

**AD-628 164 Fld. 12/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*NORTH CAROLINA UNIV CHAPEL HILL DEPT OF STATISTICS*
**A THEOREM ON FUNCTIONS OF CHARACTERISTIC FUNCTIONS AND ITS APPLICATION TO SOME RENEWAL THEORETIC RANDOM WALK PROBLEMS.**
Mimeo series,
by Walter L. Smith. Jul 65, 81p. Rept. no. Inst. of Statistics MS-437,
Contract Nonr-855 (09)

Unclassified report

Descriptors: (*Theorems, Functions), (*Stochastic processes, Theorems), Numerical analysis, Integral transforms, Statistical functions, Algebras, Taylor's series

**AD-628 274 Fld. 12/1, 14/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS*
**STOCHASTIC STABILITY AND THE DESIGN OF FEEDBACK CONTROLS.**
Technical rept.,
by H. Kushner. May 65, 37p. Rept. no. TR-65-5,
Contract AF-AFOSR-693-64 ,NGR-40-002-015
AFOSR 65-2317

Unclassified report

Descriptors: (*Stochastic processes, Control systems), (*Adaptive systems, Control systems), (*Control systems, Stochastic processes), Feedback, Functions, Experimental design

The paper describes the stochastic extensions of the various techniques for using the second method of Lyapunov to aid the construction and analysis of feedback control.

**AD-628 350 Fld. 12/1**
*PISA UNIV (ITALY)*
**METODI ANALITICI PER VARIETA ABELIANE IN CARATTERISTICA POSITIVA. CAPITOLI 3, 4 (ANALYTICAL METHODS FOR ABELIAN VARIETIES IN POSITIVE CHARACTERISTICS. CHAPTERS 3, 4),**
by Iacopo Barsotti. 1965, 56p. Contract AF-EOAR-29-63,
AFOSR 65-2739

Unclassified report

Text in Italian; Attached Summary in English. See also AD-627 550.

*Availability: Published in Annali della Scuola Normale Superiore di Pisa Scienze Fisiche e Matematiche v19 n3 (Ser3) 1965. Copies to DDC users only.*

Descriptors: (*Algebraic geometry, Theory), Algebraic topology, Italy

Chapter 3 is devoted to the classification of certain hyperalgebras called 'hyperdomains'; they form a category isomorphic to the category of canonical K-modules. Chapter 4 contains the classification of 'bidomains', namely the inverse limits of hyperdo-mains; their category is isomorphic to the category of canonical K'-modules (K' = quotient field of K). (Author)

**AD-628 364 Fld. 12/1**
**CFSTI Prices: HC $1.60 MF $0.50**
*NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST*
**ON THE SAMPLE SIZE AND SIMPLIFICATION OF A CLASS OF SPRT'S.**
Systems research memo.,
by Adnan F. Ifram. Oct 65, 17p. Rept. no. srm-143,
Contract DA-31-124-ARO (D)-322, NSF-GP-87

Unclassified report

Descriptors: (*Statistical tests, Sequential analysis), (*Sequential analysis, Statistical tests), Monte Carlo method, Probability, Optimization, Sequences

**AD-628 383 Fld. 12/1**
**CFSTI Prices: HC $2.60 MF $0.50**
*COLUMBIA UNIV NEW YORK DEPT OF MATHEMATICS*
**ACTIONS OF R (N) ON MANIFOLDS,**
Technical rept.,
by Harold Rosenberg. Aug 65, 22p. Rept. no. CU-20-ONR-266 (57)-M,
Contract Nonr-266 (57),

Unclassified report

Descriptors: (*Algebraic topology, Theory)

The author is concerned with actions of R (n) on manifolds and to what extent the topology of the manifold limits the structure of actions. It is proved that the rank of a simply connected n dimensional closed manifold is less than n-1. (Author)

**AD-628 388 Fld. 12/1**
**CFSTI Prices: HC $1.60 MF $0.50**
*TEXAS A AND M UNIV COLLEGE STATION INST OF STATISTICS*
**SAMPLING WITH UNEQUAL PROBABILITIES AND WITHOUT REPLACEMENT (EVALUATION OF ASYMPTOTIC VARIANCE FORMULAS).**
Technical rept.,
by H. O. Hartley, and R. P. Chakrabarty. 1965, 14p. Rept. no. tr-5,
Contract DA-31-124-ARO (D)-127,
AROD 4177:2

Unclassified report

Descriptors: (*Sampling, Probability), (*Analysis of variance, Effectiveness), Approximation (Mathematics), Errors

**AD-628 392 Fld. 12/1**
*INSTITUTE FOR ADVANCED STUDY PRINCETON N J*
**THE DEPENDENCE OF THE SCHOENFLIES EXTENSION ON AN ACCESSORY PARAMETER (THE TOPOLOGICAL CASE),**
by William Huebsch, and Marston Morse. 28 Oct 63, 3p. Contract AF-AFOSR-357-63, Proj. AF-9749 Task 974902,
AFOSR 65-2615

Unclassified report

*Availability: Published in Proceedings of the National Academy of Sciences, v50 n6 p1036-7 Dec 1963. Copies to DDC users only.*

Descriptors: (*Topology, Theorems), Mapping (Transformations)

**AD-628 393 Fld. 12/1**
*INSTITUTE FOR ADVANCED STUDY PRINCETON N J*
**AN ARBITRARILY SMALL ANALYTIC MAPPING INTO R+ OF A PROPER REGULAR, ANALYTIC R-MANIFOLD IN E (M),**
by Marston Morse. 20 Apr 61, 14p. Contract AF-AFOSR-357-63, Proj. AF-9749, Task 974902,
AFOSR 65-2616

Unclassified report

*Availability: Published in Instituto Lombardo - Accademia di Scienze e Lettere, v97 p650-60 1963. Copies to DDC users only.*

Descriptors: (*Mapping (Transformations), Topology), Set theory, Functions, Italy

**AD-628 397 Fld. 12/1**
*LOUISIANA STATE UNIV BATON ROUGE DEPT OF MATHEMATICS*
**INTERPOLATION AND APPROXIMATION WITH RATIONAL FUNCTIONS,**
by Pasquale Porcelli. 1964, 10p. Contract AF-AFOSR-68-63,
AFOSR 65-2181

Unclassified report

*Availability: Published in Proceedings of the Louisana Academy of Sciences v27 p118-25 Dec 1964. Copies to DDC users only.*

Descriptors: (*Approximation (Mathematics), Functions), (*Functions, Approximation (Mathematics)), Functional analysis, Polynomials, Real numbers, Sequences

Interpolation methods are studied that arise out of the problem of uniformly approximating a continuous function with certain types of rational functions. Specifically, the author is interested in learning the nature of approximating an arbitrary continuous function on bounded subsets of a set of real numbers by linear forms.

**AD-628 411 Fld. 12/1**
*CARNEGIE INST OF TECH PITTSBURGH PA*
**A GEOMETRIC PROPERTY OF THE TWO-DIMENSIONAL HARMONIC GREEN'S FUNCTION,**
by Zeev Nehari. 1964, 6p. Contract AF-AFOSR-62-414,
AFOSR 65-2622

Unclassified report

*Availability: Published in Journal of Mathematics and Mechanics v13 n6 p1009-14 Nov 1964. Copies to DDC users only.*

Descriptors: (*Green's function, Potential theory), Geometry, Boundary value problems, Convex sets

**AD-628 412 Fld. 12/1**
*CARNEGIE INST OF TECH PITTSBURGH PA*
**ON THE ZEROS OF SOLUTIONS OF N-TH ORDER LINEAR DIFFERENTIAL EQUATIONS,**
by Zeev Nehari. 20 Mar 63, 6p. Contract AF-AFOSR-62-414,
AFOSR 65-2621

Unclassified report

*Availability: Published in Journal London Math. Soc. v39 p327-32 1964. Copies to DDC users only.*

Descriptors: (*Differential equations, Numbers), Integration, Functions, Boundary value problems

**AD-628 425 Fld. 12/1**
*BRAZIL UNIV RIO DE JANEIRO INSTITUTO DE MATEMATICA PURA E APLICADA*
**THE SINGULARITIES OF INTEGRABLE STRUCTURALLY STABLE PFAFFIAN FORMS,**
by Ivan Kupka. 30 Sep 64, 3p. Contract AF-AFOSR-62-334, Proj. AF-9749, Task 974902, AFOSR 65-2620

Unclassified report

*Availability: Published in Proc Natl Acad Sci USA p1431-2 Dec 1964. Copies to DDC users only.*

Descriptors: (*Differential equations, Integration), Differential geometry, Algebraic topology, Brazil

**AD-628 431 Fld. 12/1**
*CASE INST OF TECH CLEVELAND OHIO*
**CUMULATIVE SUM CONTROL CHARTS. MATHEMATICAL PRINCIPLES APPLIED TO THEIR CONSTRUCTION AND USE, PARTS I-III,**
by N. L. Johnson, and F. C. Leone. 1962, 25p. Contract AF-AFOSR-62-72,
AFOSR 65-2603

Unclassified report

*Availability: Published in Industrial Quality Control, v18 n12 p1-7 Jun 1962; v19 n1 p8-15 Jul 1962; v19 n1 p16-22 Aug 1962. Copies to DDC users only.*

Descriptors: (*Quality control, Statistical processes), (*Statistical processes, Quality control), Graphics, Tables, Control, Processing, Industrial production

The article gives much of the mathematical development behind cumulative sum charts. It makes valuable reading for the serious student of control chart techniques and related statistical methods. It will also help anyone wishing to make use of the cumulative sum control chart to know the assumptions, characteristics and field of usefulness of the methods.

**AD-628 432 Fld. 12/1**
*TASMANIA UNIV HOBART (AUSTRALIA) DEPT OF MATHEMATICS*
**TRUNCATION ERRORS IN TWO CHEBYSHEV SERIES APPROXIMATIONS,**
by David Elliott. 3 Aug 64, 18p. Contract AF-AFOSR-660-64,
AFOSR 65-2326

Unclassified report

*Availability: Published in Mathematics of Computation, v19 n90 p234-48 Apr 1965. Copies to DDC users only.*

Descriptors: (*Approximation (Mathematics), Errors), Series, Polynomials, Complex variables, Functions, Australia

**AD-628 438 Fld. 12/1**
*MINNESOTA UNIV MINNEAPOLIS*
**ASYMPTOTIC BEHAVIOR OF SUCCESSIVE ITERATES OF CONTINUOUS FUNCTIONS UNDER A MARKOV OPERATOR,**
by Benton Jamison. 1961, 14p. Contract AF-AFOSR-381-63,
AFOSR 65-2624

Unclassified report

*Availability: Published in Journal of Mathematical Analysis and Applications, v9 n2 p203-14 Oct 1964. Copies to DDC users only.*

Descriptors: (*Functional analysis, Iterative methods), (*Operators (Mathematics), Statistical processes), Distribution theory, Topology, Probability

**AD-628 439 Fld. 12/1**
*MINNESOTA UNIV MINNEAPOLIS*
**ERGODIC DECOMPOSITIONS INDUCED BY CERTAIN MARKOV OPERATORS,**
by Benton Jamison. 3 Oct 63, 21p. Contract AF-AFOSR-381-63,
AFOSR 65-2625

Unclassified report

*Availability: Published in Transactions of the American Mathematical Society, v117 n5 p451-68 May 1965. Copies to DDC users only.*

Descriptors: (*Measure theory, Probability), (*Probability, Operators (Mathematics)), Statistical processes, Set theory, Mapping (Transformations)

Transition probability operators P (x,E) are considered on a compact metric space which satisfy a rather strong condition (uniform stability in mean). An ergodic decomposition is obtained. It is essentially a sharpening of a decomposition of Yosida's valid under less stringent conditions. The behavior is discussed of sample paths of the Markov processes themselves relative to the ergodic decomposition. Examples are given of transition probability operators which are uniformly stable in mean.

**AD-628 472 Fld. 12/1**
*LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF*
**MULTIVARIATE-NORMAL CLASSIFICATION WITH COVARIANCES KNOWN.**
Revised ed.,
by Bob E. Ellison. 14 Jun 65, 7p.

Unclassified report

Revision of manuscript received 18 Jan 65.

*Availability: Published in Annals of Mathematical Statistics v36 n6 p1787-93 Dec 1965. Copies to DDC users only.*

Descriptors: (*Multivariate analysis, Decision theory), Statistical distributions

The admissibility of the minimum distance rule (= maximum likelihood rule) and of a restricted maximum likelihood rule have been proved for a zero-one loss function in a classification problem in which information about the means of the k alternative multivariate normal distributions is based on samples. That classification problem is a special case of the problem of deciding in which of k given linear manifolds the mean of a normally distributed vector lies when the covariance matrix is known. The admissibility of the minimum distance rule (= maximum likelihood rule) in the more general problem was proved earlier. The proof is similar to that given for the special case; the choice of the prior distribution used in the proof is dictated. The purpose of this paper is to present the admissiblity proof for the more general problem. The more general problem includes classification problems in which information about the means of the k alternative multivariate normal distributions is based on samples, and the means are linearly restricted. The admissibility of classification rules in such problems has received attention recently by Das Gupta, and Srivastava.

**AD-628 521 Fld. 12/1**
*NEW SOUTH WALES UNIV KENSINGTON (AUSTRALIA)*
**INTEGRATION RULES OF HYPERCUBIC SYMMETRY OVER A CERTAIN SPHERICALLY SYMMETRIC SPACE,**
by J. N. Lyness. 12 Oct 64, 8p. Contract AF-AFOSR-62-400,

Unclassified report

*Availability: Published in Mathematics of Computation v19 n91 p471-76 July 1965. Copies to DDC users only.*

Descriptors: (*Numerical methods and procedures, Integration), (*Integration, Numerical methods and procedures), Functions, Errors, Series, Operators (Mathematics), Australia

A theory of integration rules suitable for integration over a hypercube and having hypercubic symmetry has recently been published. In this paper it is found that, with minor modification, this theory may be directly applied to obtain integration rules of hypercubic symmetry suitable for integration over a complete n-dimensional space with a weight function. As in the case of integration over hypercubes, an n-dimensional rule of degree 2t + 1 may be constructed requiring a number of function evaluations of order 2 (t)n (t)/t, only.

**AD-628 522 Fld. 12/1**
*NEW SOUTH WALES UNIV KENSINGTON (AUSTRALIA)*
**SYMMETRIC INTEGRATION RULES FOR HYPERCUBES. I. ERROR COEFFICIENTS,**
by J. N. Lyness. 6 May 64, 20p. Contract AF-AFOSR-62-400,
AFOSR 65-2698

Unclassified report

*Availability: Published in Mathematics of Computation v19 n90 p260-76 April 1965. Copies to DDC users only.*

Descriptors: (*Numerical methods and proceduces, Integration), (*Integration, Numberical methods and procedures), Errors, Functions, Series, Australia

A compact notation is introduced to describe and systematise symmetric integration rules and the Euler-Maclaurin expansion is used to describe their error terms. The application to cytolic rules is discussed especially in relation to the number of function evaluations required. This paper is devoted exclusively to theory, illustrated by well-known results. This theory leads to new powerful integration rules which will be published shortly. (Author)

**AD-628 524 Fld. 12/1**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK*
**INTEGRAL REPRESENTATIONS FOR HARMONIC FUNCTIONS IN THREE REAL VARIABLES,**
by Dorothy Graham Becker. 1964, 16p. Contract AF-AFOSR-62-59,
AFOSR 65-2627

Unclassified report

*Availability: Published in Bulletin de la Societe des Sciences et des Lettres de Lodz v15 n1 p1-14 1964. Copies to DDC users only.*

Descriptors: (*Potential theory, Integrals), (*Integrals, Functions), (*Functional analysis, Potential theory), Real variables, Operators (Mathematics)

**AD-628 582 Fld. 12/1, 20/13**
**CFSTI Prices: HC $1.10 MF $0.50**
*MINNESOTA UNIV MINNEAPOLIS*
**GALERKIN'S METHOD AND THE LOCAL POTENTIAL,**
by B. A. Finlayson, and L. E. Scriven. 1965, 9p. Contract AF-AFOSR-219-63,
AFOSR 66-0286

Unclassified report

Presented at Symposium on Non-Equilibrium Thermodynamics, Chicago, Ill. 19 May 1965.

Descriptors: (*Potential theory, Boundary value problems), (*Boundary value problems, Thermal conductivity), Calculus of variations, Approximation (Mathematics)

The advantages of viewing the local potential method as an application of Galerkin's method are threefold: (1) Variational formalism is avoided by using Galerkin's method, a conceptually simple, straightforward approximating scheme; (2) convergence proofs and other useful mathematical information are sometimes available for Galerkin's method; and (3) inasmuch as Galerkin's method is actually only one member of a family of weighted-residual methods for direct approximation using trial functions with adjustable parameters, the way is plain to alternative direct methods for attacking a problem. From the standpoint of fluid mechanics and transport theory there is considerable need for careful and systematic comparisons of these more-or-less well -established schemes and for increased attention to them by mathematicians or numerical analysts.

**AD-628 620 Fld. 12/1**
*ILLINOIS UNIV URBANA*
**ON THE LIFTING PROPERTY AND DISINTEGRATION OF MEASURES,**
by C. Ionescu Tulcea. 1965, 15p. Contract DA-31-124-ARO (D)-288,
AROD 5254:6

Unclassified report

*Availability: Published in Bulletin of the American Mathematical Society v71 n6 p829-42 Nov 1965. Copies to DDC users only.*

Descriptors: (*Measure theory, Mapping (Transformations)), (*Mapping (Transformations), Measure theory), Topology, Algebras, Functional analysis

The presentation contains discussions of the following: the existence of a lifting, the strong lifting, liftings commuting with certain groups of mappings, lower densities and liftings, integral representations of operators, disintegration of measures, and point realizations of endomorphisms of L spaces.

**AD-628 621 Fld. 12/1**
*ILLINOIS UNIV URBANA*
**GENERALIZED UNITARY OPERATORS,**
by Fumi-Yuki Maeda. 10 Mar 65, 4p. Contract DA-31-124-ARO (D)-288,
AROD 5254:1

Unclassified report

*Availability: Published in Bulletin of the American Mathematical Society v71 n4 p631-3 Jul 1965. Copies to DDC users only.*

Descriptors: (*Operators (Mathematics), Theory), Functional analysis, Topology, Integral transforms, Japan

**AD-628 626 Fld. 12/1**
**CFSTI Prices: HC $2.60 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**PROBLEMS IN THE STATISTICAL ANALYSIS OF SIMULATION EXPERIMENTS: THE COMPARISON OF MEANS AND THE LENGTH OF SAMPLE RECORDS,**
by George S. Fishman. Feb 66, 29p. Rept. no. RM-4880-PR,
Contract AF 49 (638)-1700,

Unclassified report

See also AD-612 281.

Descriptors: (*Statistical analysis, Mathematical models), (*Mathematical models, Statistical analysis), Series, Operations research, Time, Simulation, Queueing theory

This work is a continuation of research into statistical analysis of simulation experiments containing autocorrelated time series. The memorandum shows how to estimate the lengths of sample records needed to use certain large sample results in measuring stability, describes analogies between autocorrelated data and independent observations, and suggests a way to test the difference of the mean of two experiments. It also shows how the variance of the sample mean relates to the spectrum of the generating process, and describes estimation of the quantities of interest. The results expand the possibilities of statistical spectral analysis as applied to simulation experiments. (Author)

**AD-628 654 Fld. 12/1**
*VIRGINIA POLYTECHNIC INST BLACKSBURG*
**EXACT DISTRIBUTION OF THE SUM OF INDEPENDENT IDENTICALLY DISTRIBUTED DISCRETE RANDOM VARIABLES,**
by H. A. David, and J. E. Norman,Jr.. 1965, 6p. Contract DA-ARO (D)-31-124-G746,
AROD 2776:19

Unclassified report

*Availability: Published in Journal of the American Statistical Association, v60 p837-42 Sep 1965. Copies to DDC users only.*

Descriptors: (*Distribution theory, Combinatorial analysis), (*Stochastic processes, Distribution theory), Statistical distributions

Let S sub n be the sum of n independent discrete variates with common probability distribution p sub x (x = 0, 1, 2, . . . ). A table is presented which allows Pr (S sub n = s) to be written down, for any n and for s < or = 15, as a finite series involving mixed powers of the p sub x' s. If the range of x is finite (x < or = m) the table will also give Pr (S sub n = mn - s). The use of the table is illustrated and several applications are indicated. (Author)

**AD-628 655 Fld. 12/1**
*VIRGINIA POLYTECHNIC INST BLACKSBURG*
**THE PERFORMANCE OF SEVERAL TESTS FOR OUTLIERS,**
by H. A. David, and A. S. Paulson. 1965, 8p. Contract DA-ARO (D)-31-124-G746,
AROD 2776:13

Unclassified report

Prepared in cooperation with North Carolina Univ., Chapel Hill.

*Availability: Published in Biometrika, v52 n3/4 p429-36 1965. Copies to DDC users only.*

Descriptors: (*Statistical tests, Optimization), Probability, Analysis of variance

**AD-628 661 Fld. 12/1, 14/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH MATHEMATICS RESEARCH LAB*
**TOLERANCE AND CONFIDENCE LIMITS FOR CLASSES OF DISTRIBUTION BASED ON FAILURE RATE.**
Mathematical note,
by Richard E. Barlow, and Frank Proschan. Jan 66, 26p. Rept. no. MN-446 ,D1-82-0503

Unclassified report

Also available from the authors.

Descriptors: (*Statistical analysis, Statistical distributions), (*Statistical distributions, Reliability), Life expectancy, Quality control, Operations research

This paper extends the validity of exponential tolerance and confidence limits, under certain restrictions, to classes of distributions based on failure rate. In particular, the usual exponential lower tolerance limit is shown to be conservative for the increasing failure rate class of distributions in the

range of population coverages and confidence coefficients of practical interest. Conservative confidence limits are also obtained on the mean. (Author)

**AD-628 663 Fld. 12/1**
*NATIONAL BUREAU OF STANDARDS WASHINGTON D C*
**ERROR BOUNDS FOR ASYMPTOTIC SOLUTIONS OF SECOND-ORDER DIFFERENTIAL EQUATIONS HAVING AN IRREGULAR SINGULARITY OF ARBITRARY RANK.**
Revised ed.,
by F. W. J. Olver, and F. Stenger. 12 Nov 64, 7p.
Proj. AROD-4238-M,
AROD 4238:3
Unclassified report

Revision of manuscript submitted 21 Aug 64.

*Availability: Published in J. SIAM Numer. Anal. (SerB) v2 n2 p244-9 1965. Copies to DDC users only.*

Descriptors: (*Asymptotic series, Differential equations), (*Differential equations, Asymptotic series), Errors, Integral equations, Approximation (Mathematics)

Recently, error bounds were derived for asymptotic expansions of solutions of a differential equation in a region containing an irregular singularity of rank one. The purpose of the present paper is to give similar bounds for the corresponding expansions in a region containing a singularity of higher rank.

**AD-628 665 Fld. 12/1**
*NATIONAL BUREAU OF STANDARDS WASHINGTON D C*
**ON THE ASYMPTOTIC SOLUTIONS OF SECONDORDER DIFFERENTIAL EQUATIONS HAVING AN IRREGULAR SINGULARITY OF RANK ONE, WITH AN APPLICATION TO WHITTAKER FUNCTIONS.**
Revised ed.,
by F. W. J. Oliver. 12 Nov 64, 19p. Proj.
AROD-4238-M,
AROD 4238:1
Unclassified report

Revision of manuscript submitted 24 Jun 64.

*Availability: Published in J. SIAM Numer. Anal., (ser B) v2 n2 p225-43 1965. Copies to DDC users only.*

Descriptors: (*Asymptotic series, Differential equations), (*Differential equations, Asymptotic series), (*Special functions (Mathematical), Asymptotic series), Approximation (Mathematics), Integral equations, Errors

Strict error bounds are established for the wellknown asymptotic expansions of solutions of the general linear second-order ordinary differential equation in the neighborhood of an irregular singularity of rank one. These bounds are closely related to the variation of the first neglected term of the truncated series, and in this respect resemble bounds obtained previously for asymptotic solutions of second-order differential equations containing a large parameter. A new theory is applied to the Whittaker form of the differential equation satisfied by the confluent hypergeometric functions. Error bounds are obtained, for the first time, for the asymptotic expansions of these functions for large complex values of the independent variable z, and unrestricted values of the parameters k and m. The bounds are in a form immediately suitable for numerical evaluation. By incorporating them in automatic computing routines for evaluating the Whittaker functions, any uncertainty concerning the errors associated with the use of the asymptotic expansions can be eliminated completely. (Author)

**AD-628 697 Fld. 12/1**
*UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF ELECTRICAL ENGINEERING*
**INVARIANCE, UNCONTROLLAABILITY, AND UNOBSERVABILITY IN DYNAMICAL SYSTEMS,**
by P. K. C. Wang. 3 Feb 65, 3p. Contract AF-AFOSR-496-65, Proj. AF-4751,
AFOSR 65-2449
Unclassified report

*Availability: Published in IEEE Transactions on Automatic Control, vAC10 n3 p366-7 Jul 1965. Copies to DDC users only.*

Descriptors: (*Invariance, Control systems), (*Control systems, Invariance), Dynamics, Linear systems, Differential equations

The purpose of this correspondence is to indicate that the notions of controllability and observability also can be interpreted in the variational framework, and one may classify uncontrollability and unobservability under the general category of invariance properties. In the sequel, the notions of uncontrollability and unobservability for linear ordinary differential systems will be established first. Then, the extension of these notions to nonlinear ordinary differential systems will be discussed. (Author)

**AD-628 703 Fld. 12/1**
*CALIFORNIA UNIV BERKELEY DEPT OF MATHEMATICS*
**PERFECT CLOSURES OF RINGS AND SCHEMES.**
by Marvin J. Greenberg. 22 Oct 63, 9p. Contract AF-AFOSR-121-63, Proj. AF-9749, Task 974902,
AFOSR 65-2604
Unclassified report

*Availability: Published in Proceedins of the American Mathematical Society, v16 n2 p313-7 Apr 1965. Copies to DDC users only.*

Descriptors: (*Rings (Mathematics), Algebraic geometry), Mapping (Transformations), Monaids

**AD-628 714 Fld. 12/1**
*COURANT INST OF MATHEMATICAL SCIENCES NEW YORK UNIV N Y*
**NON-COERCIVE BOUNDARY VALUE PROBLEMS,**
by L. Nirenberg, and J. J. Kohn. Sep 64, 51p.
Contract DA-31-124-ARO (D)-204,
AROD 247:67
Unclassified report

Prepared in cooperation with Brandeis Univ., Waltham, Mass.

*Availability: Published in Communications on Pure and Applied Mathematics, v18 n3 p443-92 Aug 1965. Copies to DDC users only.*

Descriptors: (*Boundary value problems, Theory)

**AD-628 721 Fld. 12/1**
*COLUMBIA UNIV NEW YORK ELECTRONICS RESEARCH LABS*
**SOME MULTIVARIATE DENSITY FUNCTIONS OF PRODUCTS OF GAUSSIAN VARIATES,**
by K. S. Miller. 1964, 2p. Contract DA-31-124-ARO (D)-255,
AROD 5132:1
Unclassified report

*Availability: Published in Biometrika, v52 n3/4 p645-6 1965. Copies to DDC users only.*

Descriptors: (*Multivariate analysis, Distribution functions), Calculus of variations, Equations

**AD-628 760 Fld. 12/1**
**CFSTI Prices: HC $5.00 MF $1.00**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C APPLIED MATHEMATICS LAB*
**NUMERICAL DETERMINATION OF SPHEROIDAL WAVE FUNCTION EIGENVALUES AND EXPANSION COEFFICIENTS,**
by M. M. Stuckey, and L. L. Layton. Jan 64, 189p. Rept. no. AML-164,
Unclassified report

Descriptors: (*Special functions (Mathematical), Determination), (*Numerical methods and procedures, Special functions (Mathematical)), Difference equations, Continued fractions, Tables

A method of calculating the eigenvalues and the expansion coefficients of spheroidal wave functions for the prolate and oblate case using a high-speed computer is presented. Special emphasis is placed on a new explanation of the role the parameter n plays in the numerical determination of eigenvalues. Curves and tables of eigenvalues are included.

**AD-628 169** **See Fld. 9/2**

**AD-628 179** **See Fld. 20/9**

**AD-628 181** **See Fld. 20/9**

**AD-628 202** **See Fld. 5/7**

**AD-628 315** **See Fld. 20/10**

**AD-628 319** **See Fld. 9/2**

**AD-628 329** **See Fld. 20/10**

**AD-628 330** **See Fld. 20/10**

**AD-628 540** **See Fld. 20/4**

**AD-628 542** **See Fld. 20/4**

**AD-628 687** **See Fld. 6/3**

**AD-628 701** **See Fld. 5/9**

**AD-628 706** **See Fld. 6/4**

**AD-628 707** **See Fld. 6/4**

**AD-628 708** **See Fld. 6/4**

**AD-628 709** **See Fld. 6/4**

**AD-628 710** **See Fld. 6/4**

**AD-628 725** **See Fld. 9/4**

**AD-628 737** **See Fld. 20/14**

## 12/2. OPERATIONS RESEARCH

**AD-628 067 Fld. 12/2, 5/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF MATHEMATICS*
**THE INEQUALITIES THAT DETERMINE THE BARGAINING SET M1 (I).**
Research memo.,
by Michael Maschler. Jan 66, 17p. Rept. no. rm-17,
Contract N62558-4355, Proj. NR-047-045,
Unclassified report

Rept. on Research Program in Game Theory and Mathematical Economics.

Descriptors: (*Game theory, Bargaining), (*Inequalities, Game theory), Set theory, Israel

The various bargaining sets are solution concepts for cooperative multi-person games. From an ex-

amination of their definitions one can deduce that each bargaining set can be represented as a solution of a system of linear inequalities, connected by the words 'and' and 'or.' The problem of determining these systems in explicit form therefore arises. Such systems may serve both computational and theoretical purposes. This paper presents the system of linear inequalities which determine the bargaining set. (Author)

**AD-628 096 Fld. 12/2**
**CFSTI Prices: HC $1.60 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**A PROPERTY OF SEQUENTIAL CONTROL PROCESSES,**
by Ralph E. Strauch, and Arthur F. Veinott Jr..
Jan 66, 14p. Rept. no. RM-4772-PR,
Contract AF 49 (638)-1700,
Unclassified report

Descriptors: (*Stochastic processes, Control), (*Control, Stochastic processes), Decision making, Probability, Dynamic programming, Time, Sequences

This memorandum deals with discrete time stochastic control processes having a finite number of states and possible actions. If the process is in state i at time t and one makes decision d sub k, it moves to state j at time t + 1 with probability q sub ij (k). A rule R is a (possibly random) procedure for choosing a decision at each time t given the past up to time t. Each rule R determines a probability P sub R on the set of possible sample paths of the process. Derman (Annals Math. Stat., 35, 1964) has shown that, for criteria involving limiting average probabilities of visits to state-decision pairs, one needs only to consider initial randomizations of nonrandom stationary rules. It is shown that there is a rule which induces the same probability on the process as any initial randomization, hence nothing new is introduced by initial randomization. (Author)

**AD-628 112 Fld. 12/2, 9/3**
**CFSTI Prices: HC $8.60 MF $0.75**
*ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB*
**SYSTEM OPTIMIZATION WITH FIXED CONTROL STRUCTURE,**
by Michael Schoenberger. Jan 66, 82p. Rept. no. R-278,
Contract DA-28-043-AMC-00073 (E)
Unclassified report

Submitted as Doctoral thesis to the University of Illinois, Dept. of Electrical Engineering, 1966.

Descriptors: (*Optimization, Systems engineering), (*Control systems, Optimization), Boundary value problems, Algorithms, Statistical functions, Submarines, Maneuverability

The implementation difficulties associated with most conventional formulations of the optimal control problem are eliminated by introducing structural specifications on the control as constraints. Necessary conditions, in the form of a nonlinear two-point boundary value problem, are obtained from the calculus of variations. An algorithm for obtaining numerical solutions to a class of problems in which the initial conditions are a priori known, is presented. It is applied to the problem of optimal submarine diving, and the performances for various control configurations are compared. Another procedure, which permits the minimization of statistical functions of the performance index, when the probability distribution of initial conditions is known, is also presented. This procedure, which is especially useful when the terminal time is infinite, is obtained from ordinary calculus procedures. (Author)

**AD-628 172 Fld. 12/2, 5/3**
**CFSTI Prices: HC $6.60 MF $0.75**
*HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF MATHEMATICS*
**THE STRUCTURE OF THE KERNEL OF A COOPERATIVE GAME.**
Technical research memo.,
by Michael Maschler, and Bezalel Peleg. Nov 65, 63p. Rept. no. RM-16,
Contract N62558-4355, Proj. RR-003-0701 ,NR-047-045
Unclassified report

Report on Research Program in Game Theory and Mathematical Economics.

Descriptors: (*Game theory, Bargaining), Set theory, Inequalities, Israel

A study of the kernel of a cooperative game. In this paper the authors derive a procedure for the players which, if abided by, leads to an outcome in the kernel. Moreover, each outcome in the kernel can be reached by this procedure. The procedure consists of a set of three rules and involves the formation of 'intermediate coalitions' which play 'intermediate games,' after which the members of each intermediate coalition play a 'reduced game' to decide the share of their spoils. The procedure is further analyzed in the case of monotonic games and in the case of simple games, and the results that are obtained reduce considerably the amount of computation which is needed to compute the kernels of such games. In particular, they compute the kernel of the 7-person projective game (for the grand coalition), which is a star consisting of seven straight-line segments connecting the center to the points of the main simple solution. Finally, conditions under which modifications of the characteristic function do not change its kernel are presented. (Author)

**AD-628 199 Fld. 12/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH MATHEMATICS RESEARCH LAB*
**THE D-STEP CONJECTURE FOR POLYHEDRA OF DIMENSION D<6,**
by Victor Klee, and David W. Walkup. Dec 65, 47p. Rept. no. D1-82-0495 ,Mathematical note-441
Unclassified report

Also available from the authors.

Descriptors: (*Convex sets, Geometry), (*Combinatorial analysis, Geometry), (*Linear programming, Theory), Algorithms, Inequalities

Two functions A and B, of interest in combinatorial geometry and the theory of linear programming, are defined and studied. A (d,n) is the maximum diameter of convex polyhedra of dimension d with n faces of dimension d-1; similarly, B (d,n) is the maximum diameter of bounded polyhedra of dimension d with n faces of dimension d-1. The diameter of a polyhedron P is the smallest integer k such that any two vertices of P can be joined by a path of k or fewer edges of P. It is shown that the bounded d-step conjecture, i.e. B (d,2d) = d, is true for d < or 5. It is also shown that the general d-step conjecture, i.e. A (d,2d) < or = d, of significance in linear programming, is false for d equal to or greater than 4. A number of other specific values and bounds for A and B are presented.

**AD-628 219 Fld. 12/2, 19/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*HARRY DIAMOND LABS WASHINGTON D C*
**TABLES OF BEST TCHEBYCHEFF APPROXIMANTS FOR TIME-DELAY SIMULATION,**
by Arthur Hausner, and Cita M. Furlani. 30 Dec 65, 48p. Rept. no. TM-65-58,
Proj. HDL-39833 ,DA-1P-014501B14A
Unclassified report

Descriptors: (*Tables, Time-lag theory), (*Approximation (Mathematics), Functions), (*Time-delay relays, Simulation), Analog computers, Errors, Potentiometers, Circuits, Bandwidth

This report presents tables of all-pass rational-fraction transfer functions that approximate a time delay tau to within an error E for frequencies omega such that 0 < omega tau < k. The coefficients are optimized to maximize the bandwidth, k, given the order n of the transfer function and the error E.

**AD-628 265 Fld. 12/2**
*CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING*
**ON CONTROL SYSTEM EQUIVALENTS OF SOME DECISION THEORETIC THEOREMS,**
by David D. Sworder. 1964, 16p. Contract Nonr-233 (52) ,AF-AFOSR-62-68
AFOSR 65-2425
Unclassified report

*Availability: Published in Journal of Mathematical Analysis and Application v10 n2 p424-38 Apr 1965. Copies to DDC users only.*

Descriptors: (*Theorems, Control systems), (*Optimization, Control systems), (*Decision theory, Stochastic processes), Dynamic programming, Distribution functions, Adaptive control systems

The paper shows that theorems almost identical to those in statistical decision theory hold for control systems with unknown parameters in obtaining complete classes of control policies, such that control policies not in the complete set need not be considered in optimizing control systems. The paper also shows that some of the basic assumptions needed for these theorems are satisfied in most control situations. This has many implications in control problems. For example, in discussing adaptive control problems Bellman and Kalaba (AD-423 467) used the assumption that they consider only control policies with Bayes property in deriving the functional equations of dynamic programming. It can now be shown, however, that the set of Bayes control policies form a complete class of control policies under certain conditions, and if sufficient statistics exist, then the set of control policies utilizing sufficient statistics forms a complete class. Thus, some assumptions which have been made arbitrarily in the past can be removed and/or justified in dealing with control systems with unknown parameters. (Author)

**AD-628 296 Fld. 12/2**
**CFSTI Prices: HC $1.60 MF $0.50**
*POLYTECHNIC INST OF BROOKLYN FARMINGDALE N Y DEPT OF ELECTRICAL ENGINEERING*
**APPLICATION OF GAME THEORY TO THE SENSITIVITY DESIGN OF SYSTEMS WITH OPTIMAL CONTROLLER STRUCTURES,**
by P. Dorato, and A. Kestenbaum. 1965, 11p.
Contract DA-31-124-ARO (D)-316 ,AF 49 (638)-1402
AFOSR 65-2102
Unclassified report

Descriptors: (*Game theory, Systems engineering), (*Systems engineering, Game theory), Design, Optimization, Control systems

The theory of games is applied to of design of systems with unknown plant parameters. It is assumed that a controller structure is known and furthermore this controller is optimal when the controller parameters are equal to the plant parameters. The performance index then becomes a function of plant and controller parameters. This function is treated as a pay-off function with the antagonists represented by the controller and plant parameters. (Author)

**AD-628 336 Fld. 12/2, 14/4**
**CFSTI Prices: HC $5.60 MF $0.50**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*

**ON REGRESSION TECHNIQUES FOR ESTIMATING THE PARAMETERS OF WEIBULL CUMULATIVE DISTRIBUTIONS.**
Master's thesis,
by David Ian Gross. Dec 65, 51p. Rept. no. GRE/MATH/65-4,

Unclassified report

Descriptors: (*Statistical analysis, Statistical distributions), (*Statistical distributions, Statistical analysis), Least squares method, Reliability, Distribution functions

A regression technique for estimating Weibull scale and shape parameters is introduced and experimentally investigated. The derivation involves maximizing the likelihood function of a set of normal density functions which give the probabilities of sub fi items failing until time ti. The estimation technique was evaluated using simulated failure data and the estimators were found to be optimal according to Kolmogorov-Smirnov tests. When compared with the Harter-Moore MLE iteration technique the regression method was 145 times faster and yielded Kolmogorov-Smirnov values 26 percent lower. Of 1100 estimations only one could not be accepted at the .20 confidence level as having come from the failure data. The method is well suited for small computers such as the IBM 1620 and may be employed to analyze incomplete r censored samples of failure data. (Author)

**AD-628 361 Fld. 12/2**
**CFSTI Prices: HC $2.60 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**INTEGER PROGRAMMING BY IMPLICIT ENUMERATION AND BALAS' METHOD,**
by Arthur M. Geoffrion. Feb 66, 27p. Rept. no. rm-4783-PR,
Contract AF 49 (638)-1700,

Unclassified report

Descriptors: (*Linear programming, Algorithms), (*Algorithms, Linear programming), (*Combinatorial analysis, Linear programming), Numbers, Optimization, Programming (Computers), Effectiveness

This memorandum presents a reformulation of the essentials of Balas' algorithm for the zero-one integer linear programming problem, and is based upon the idea of 'elementary tree search' that has also been used by Glover as the basis for his multiphase-dual algorithm. The present reformulation requires considerably less computer storage than the original version, and clarifies the rationale behind the algorithm, thereby leading naturally to variants and extensions. (Author)

**AD-628 381 Fld. 12/2**
**CFSTI Prices: HC $1.60 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**THE ASSIGNMENT INTERFERENCE MODEL,**
by Raoul J. Freeman. Feb 66, 14p. Rept. no. p-3312,

Unclassified report

Descriptors: (*Nonlinear programming, Scheduling), (*Scheduling, Mathematical models), (*Mathematical models, Operations research), Potential theory, I Model theory

This study formulates a nonlinear discrete programming problem of a simple kind called the assignment interference problem, and describes a solution procedure for it. The problem is also related to the quadratic assignment problem. Variants of the basic assignment interference model seem to occur in assigning intelligence intercept equipment, scheduling classes in universities, finding loads and schedules in space base supply systems, and allocating sets of people to tasks wherein they affect each others' performance. In the intercept case, several potential targets may be accessible to a piece of intercept equipment simultaneously, and it must be decided which to track. At a university, a student may wish to take several courses that are scheduled for the same time; the problem is to derive a schedule of classes that will minimize student frustrations (in terms of lost classes). In the space supply situation, various pieces of cargo compete for limited capacity available for a series of supply trips, and assignments must be made so as to insure timely arrivals of materials and observance of capacity constraints. The 'assignment interference model is applicable to the above and similar types of problems. (Author)

**AD-628 574 Fld. 12/2, 5/1**
*NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST*
**CONSTRAINED GENERALIZED MEDIANS AND HYPERMEDIANS AS DETERMINISTIC EQUIVALENTS FOR TWO-STAGE LINEAR PROGRAMS UNDER UNCERTAINTY,**
by A. Charnes, W. W. Cooper, and G. L. Thompson. Jul 61, 30p. Contract Nonr-1228 (10),Nonr-760 (24) Proj. NR-047-021 ,NR-047-048

Unclassified report

Prepared in cooperation with Carnegie Inst. of Tech., Pittsburgh, Pa.

*Availability: Published in Management Science, v12 n1 p83-112 Sept 1965. Copies to DDC users only.*

Descriptors: (*Linear programming, Uncertainty), (*Uncertainty, Linear programming), Decision theory, Management planning, Operations research

In linear programming under uncertainty the two-stage problem is handled by assuming that one chooses a first set of constrained decision variables; this is followed by observations of certain random variables after which another set of decisions must be made to adjust for any constraint violations. The objective is to optimize an expected value functional defined relative to the indicated choices. This paper shows how such problems may always be replaced with either constrained generalized medians or hypermedians in which all random elements appear only in the functional. The resulting problem is called a deterministic equivalent for the original problem since (a) the originally defined objective replaces all random variables by corresponding expected values and (b) the remaining constraints do not contain any random terms. Significant classes of cases are singled out and special attention is devoted to the structure of the constraint matrices for these purposes. Numerical examples are supplied and related to the previous literature. Other properties of these models are also examined and related to types of problems which are often of interest. For instance the hypermedian and generalized median formulations involve minimizations over absolute value terms in the functional. (Author)

**AD-628 625 Fld. 12/2, 7/4**
**CFSTI Prices: HC $6.60 MF $0.75**
*RAND CORP SANTA MONICA CALIF*
**ON THE CONTINUITY OF THE MINIMUM SET OF A CONTINUOUS FUNCTION,**
by George B. Dantzig, Jon H. Folkman, and Norman Shapiro. Feb 66, 64p. Rept. no. RM-4657-PR,
Contract AF 49 (638)-1700,

Unclassified report

Descriptors: (*Linear programming, Chemical equilibrium), Functions, Calculus of variations, Inequalities, Theory

This memorandum obtains necessary and sufficient conditions so that the solution of a constrained minimization problem will vary continuously when the constraints and objective function are varied. It also obtains special results in the case that the constraints are linear inequalities. (Author)

**AD-628 696 Fld. 12/2**
*BROWN UNIV PROVIDENCE R I*
**ON SYSTEM FUNCTIONS WITH THE PROPERTY OF SEPARABILITY,**
by Leonard Weiss. 9 Dec 64, 11p. Contract AF-AFOSR-693-64,
AFOSR 65-2130

Unclassified report

Prepared for presentation at the Allerton Conference on Circuit and System Theory (2nd), University of Illinois, September 1964.

*Availability: Published in International Journal of Control v1 n5 p487-96 May 1965. Copies to DDC users only.*

Descriptors: (*Functions, Control systems), Differential equations, Integral transforms, Synthesis, Operations research, Separation

This paper considers linear differential (time-varying) systems which may be described by either of two system functions based on a specified integral transform. In particular, those systems are discussed for which at least one of the aforementioned system functions is separable in its two arguments. Physical interpretations of separable system functions are given and two theorems are proved which yield sufficient conditions for the presence of this property. It is also proved that the so-called 'bi-frequency' function of Zadeh must be separable for linear differential systems. Finally, the problem of approximately representing a given system by a separable system function based on the Laplace transform is discussed. (Author)

**AD-628 699 Fld. 12/2**
*BROWN UNIV PROVIDENCE R I*
**ON THE STABILITY OF SYSTEMS DEFINED OVER A FINITE TIME INTERVAL,**
by Leonard Weiss, and E. F. Infante. 21 May 65, 7p. Contract AF-AFOSR-693-64 ,NGR-40-002-015
AFOSR 65-2129

Unclassified report

*Availability: Published in Proceedings of the National Academy of Sciences v54 n1 p44-8 Jul 1965. Copies to DDC users only.*

Descriptors: (*Control systems, Stability), Time, Differential equations, Integral transforms

Consider the system of n first-order real differential equations represented in vector form by dx/dt = f (x,t) defined over a finite interval of time. The function f is assumed to be smooth enough in x and t (over T) to assure existence and uniqueness of solutions over T as well as the continuous dependence of the solutions on initial conditions at t sub o. It is not required that f (0,t) = 0. The purpose of this note is to present some results toward the establishment of a comprehensive qualitative theory of stability for such systems.

**AD-628 700 Fld. 12/2**
*BROWN UNIV PROVIDENCE R I*
**SOME PROBLEMS AND SOME RECENT RESULTS IN STOCHASTIC CONTROL,**
by Harold J. Kushner. 1965, 11p. Contract AF-AFOSR-693-64,NGR-40-002-015 Proj. AF-9749, Task 974901,
AFOSR 65-2128

Unclassified report

*Availability: Published in IEEE International Convention Record pt6 p108-16 1965. Copies to DDC users only.*

Descriptors: (*Stochastic processes, Control systems), (*Control systems, Stochastic processes), Differential equations, Time, Dynamic programming, Synthesis

This paper is divided into two major sections. The first section is of the nature of both a review of work in stochastic optimal control in the past two years, and a brief discussion of a few of the important remaining problems. There are some remarks on noise sources and their mathematical description, a discussion of the partial differential equation obtained by the application of dynamic programming to a class of continuous time models, and a list of references to a few other problems and approaches. The second section is more specific and discusses the application of some recent results of the author (in the theory of stochastic stability) to the design of controllers for linear and non-linear stochastic systems. The latter material, giving techniques for obtaining optimal controls to a number of stochastic problems, rounds out the first part, and is of interest since, via some perhaps small (if any) changes in problem statements, a number of solutions can be obtained. In fact, there are stochastic analogies to almost all of the suggested applications of Liapunov theory to the choice of feedback controls in deterministic systems. (Author)

**AD-628 704 Fld. 12/2**
*BROWN UNIV PROVIDENCE R I*
**DUAL DYNAMICAL SYSTEMS AND THEIR REPRESENTATION BY SYSTEM FUNCTION.**
by Leonard Weiss. 9 Dec 64, 13p. Contract AF-AFOSR-693-64, Proj. AF-9749, Task 974901, AFOSR 65-2127
Unclassified report

*Availability: Published in International Journal of Control v1 n5 p475-85 May 1965. Copies to DDC users only.*

Descriptors: (*Control systems, Functions), (*Functions, Control systems), Differential equations, Input-output systems, Dynamics, Intergral transforms

The system function concept is an extension of the usual application of the transform method to linear systems. In this paper it is shown that there are two system functions which can be naturally associated with a given system and that each one can be interpreted in two ways. These alternate interpretations are used to show that the same system function provides a means for calculating the time-domain output of a given system and the transform-domain output of the dual system (defined as the adjoint of the given system with reversal of the time scale ordering). (Author)

**AD-628 719 Fld. 12/2**
*RIAS INC BALTIMORE MD*
**ON GENERALIZED DYNAMICAL SYSTEMS DEFINED BY CONTINGENT EQUATIONS,**
by Emilio Roxin. 1965, 20p. Contract AF 49 (638)-1242,Nonr-3693 (00) Proj. AF-9749, Task 974901, AFOSR 65-2327
Unclassified report

*Availability: Published in Journal of Differential Equations, v1 n2 p188-205 Apr 1965. Copies to DDC users only.*

Descriptors: (*Differential geometry, Control systems), Functional analysis, Theorems, Differential equations, Topology

**AD-628 099 See Fld. 14/1**

**AD-628 220 See Fld. 9/2**

**AD-628 335 See Fld. 9/2**

**AD-628 554 See Fld. 17/9**

**AD-628 776 See Fld. 9/2**

# Field 13-MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

## 13/1. AIR CONDITIONING, HEATING, LIGHTING, AND VENTILATING

**AD-628 295 See Fld. 20/5**

**AD-628 614 See Fld. 14/2**

## 13/2. CIVIL ENGINEERING

**AD-628 140 Fld. 13/2, 1/5**
**CFSTI PricesMF $0.75**
*OHIO RIVER DIV LABS MARIEMONT RIGID PAVEMENT LAB*
**LOCKBOURNE NO. 3, OVERLAY MAT, PAVEMENT OVERLAY INVESTIGATION.**
Rept. of Construction.
Jun 48, 109p.
Unclassified report

*Availability: Available from Corps of Engineers, Ohio River Div. Labs., Mariemont, Ohio $1.00.*

Descriptors: (*Pavements, Construction), (*Landing fields, Pavements), Concrete, Asphalt, Soils, Clay, Tests, Test methods

The purpose and objectives of this investigation were to obtain information on the behavior, under B-29 airplane wheel loads, of flexible overlays of various thicknesses and design on a rigid pavement with a relatively poor subgrade, and to correlate this information with that obtained by the South Atlantic Division for such overlays on rigid pavements with good and medium subgrades. This report is concerned with the design and construction of the Test Section and is prepared for the purpose of providing a record of the design features, the details of construction, and the physical properties of the concrete, overlay materials, and subgrade soil. The report will serve as a guide in analyzing the results obtained by the traffic tests and accompanying measurements of strain and deflection. (Author)

**AD-628 209 Fld. 13/2**
*FRITZ ENGINEERING LAB LEHIGH UNIV BETHLEHEM PA*
**STRUCTURAL SUBASSEMBLAGES PREVENTED FROM SWAY,**
by Victor Levi, George C. Driscoll,Jr., and Le-Wu Lu. 1965, 29p. Rept. no. Fritz Reprint-279, Contract NObs-94092 ,NBY-53160
Unclassified report

*Availability: Published in Journal of the Structural Div., Proceedings of the American Society of Civil Engineers, Proc. Paper 4509, v91 nSt5 p103-27 Oct 1965. Copies to DDC users only.*

Descriptors: (*Structures, Civil engineering), Beams (Structural), Structural properties, Mathematical analysis, Plasticity, Loading (Mechanics)

A method for analyzing nonsway beam-and-column subassemblages, which are parts of a braced multistory frame, is presented. The type of subassemblage studied consists essentially of a column framed at its ends to beams of known properties. When subjected to load, the beams will deform with the column and thus provide restraint at the ends of the column. The method can be used to study both the elastic and inelastic behavior of subassemblages provided the material properties are known. Application of the method to the analysis of beam-columns continuous over several supports is also illustrated. (Author)

**AD-628 210 Fld. 13/2**
*FRITZ ENGINEERING LAB LEHIGH UNIV BETHLEHEM PA*
**STRENGTH OF SINGLE-STORY STEEL FRAMES,**
by Joseph A. Yura, and Theodore V. Galambos. 1965, 25p. Rept. no. Fritz Reprint-284, Contract NObs-94092 ,NBY-53160
Unclassified report

*Availability: Published in Journal of the Structural Div., Proceedings of the American Society of Civil Engineers, Proc. paper 4507, v91 nST5, p81-101 Oct 1965. Copies to DDC users only.*

Descriptors: (*Structures, Civil engineering), Steel, Beams (Structural), Structural properties, Mathematical analysis, Buckling (Mechanics), Plasticity, Loading (Mechanics)

The strength of single-story, pinned-base rigid steel frames subjected to vertical and horizontal loads is developed. Interaction curves between the axial load and the horizontal load are developed for a column L/r = 40. Inelastic behavior and residual stresses are considered. Equilibrium of the deflected structure is considered so that the P-delta effect (the additional moments caused by the deflection at the column tops and the axial load in the columns) is investigated. The structural behavior of the structure is examined. The results of the analysis are compared with the 1961 and 1963 AISC Specifications. (Author)

**AD-628 285 Fld. 13/2, 13/13**
**CFSTI Prices: HC $8.60 MF $0.75**
*ILLINOIS UNIV URBANA DEPT OF CIVIL ENGINEERING*
**STRENGTH AND BEHAVIOR OF SIMULATED CULVERT SECTIONS FAILING IN SHEAR.**
Structural research series on Civil Engineering Studies, (Final),
by R. Diaz de Cossio, and C. P. Siess. Jun 57, 84p. Rept. no. SRS-137,
Contract DA-33-017-CIVENG-57-2,
Unclassified report

Descriptors: (*Structural parts, Models (Simulations)), (Loading (Mechanics), Structural parts), Reinforced concrete, Mechanical properties, Failure (Mechanics), Shear stresses, Drainage

The object of this investigation was to explore the behavior and strength in shear of uniformly-loaded reinforced concrete frames. Eleven frames were tested, all under-reinforced in the horizontal member. Eight frames had no web reinforcement, while three had web reinforcement in the horizontal member in the form of bent bars symmetrically placed about midspan. Two different clear spans were used, six and ten feet; and two different ratios of horizontal to vertical load, onethird and twothirds. The reinforcement was provided so as to be approximately in proportion to the maximum positive and negative moments thus produced, using typical ratios of moment to axial load. Of the eight frames without web reinforcement tested, the four with longer span failed in diagonal tension, and the four with shorter spans failed in shear-compression. For a given span length, the load carrying capacity was not greatly increased with increasing axial load. Using the test data, a relationship was found between the shear at critical section and the axial load, both at cracking load. The ratio of axial load to shear at cracking was related to another independent parameter, the degree of fixity. The ratio of axial load to shear at cracking at the critical section seemed to depend on the span length and on the ratio of horizontal to vertical load, in addition to the degree of fixity. However, the effects of these additional variables could not be determined precisely from the limited number of tests made so far.

**AD-628 286 Fld. 13/2, 1/5, 14/2**
**CFSTI Prices: HC $11.60 MF $0.75**
*OHIO RIVER DIV LABS MARIEMONT*
**LOCKBOURNE NO. 1 - TEST TRACK, ACCELERATED TRAFFIC TESTS OF CONCRETE PAVEMENTS.**
Final rept.
Mar 46, 118p.
Unclassified report

Descriptors: (*Landing fields, Pavements), (*Pavements, Accelerated testing), Reinforced concrete, Test facilities, Test methods, Tests, Loading (Mechanics), Substrates, Soils

The purpose of the investigation was to study the behavior of full scale 6, 8, and 10-inch concrete pavement slabs on different subgrades and bases under 20, 37, and 60 thousand pound wheel load accelerated traffic, as well as a limited number of overlay and steel reinforced concrete slab designs under the same loadings. The principal objectives which have been answered within the limitation of the tests were: to check the method of design outlined in the Engineering Manual, March 1943 edition, to study the effects of types of subgrade, type and thickness of granular base course, type and spacing of joints, and the use of steel reinforcement in concrete pavements, and to study the behavior of concrete overlays under traffic loading. Prior to and during traffic, deflection measurements at the interior, edge, and corner of the test slabs were made under moving and stationary wheel loads by means of the Woodman type electrical gage and mechanical extensometers. Also, at intervals during traffic, cracks and other types of pavement failures were recorded by plotting and photographs. A continuous temperature record during traffic was obtained in the top, middle, and bottom of selected test slabs by thermohms installed during construction.

**AD-628 290 Fld. 13/2, 1/5, 14/2**
**CFSTI Prices: HC $6.60 MF $0.75**
*OHIO RIVER DIV LABS MARIEMONT RIGID PAVEMENT LAB*
**LOCKBOURNE NO. 1 - TEST TRACK, REPORT OF RECONSTRUCTION.**
Jan 45, 64p.

Unclassified report

Descriptors: (*Landing fields, Pavements), (*Pavements, Test facilities), (*Reinforced concrete, Pavements), Construction, Joints, Expansion joints, Substrates, Soil mechanics, Accelerated testing, Reinforcing materials, Steel, Rods

The report describes the construction and tests made on materials for the test slabs built in the period of time extending from 5 June to 10 July 1944. The design and construction of the original track are given in detail by the Design and Construction Report of June 1944. This reconstruction was started after five of the slabs in Lane 1 had been completely destroyed by the traffic tests, and five of the slabs in Lane 2 had been damaged sufficiently to require the overlay type of construction originally planned in the event of early failure by the traffic tests. The investigation of rigid pavement design was conducted at the Lockbourne Army Air Base, located approximately 15 miles south of Columbus, Ohio, and consists of testing two traffic lanes each, made up of twenty 20 x 40-foot concrete slabs, connected with 10-foot transition slabs. The test slabs form a continuous track with two 490-foot tangents connected by semi-circular turns at each end. The concrete pavement thickness and the base course construction vary from section to section. The Test Track was subjected to traffic applied with heavy earth moving equipment which can be loaded to produce predetermined wheel loads.

**AD-628 357 Fld. 13/2, 1/5**
**CFSTI Prices: HC $7.60 MF $0.75**
*OHIO RIVER DIV LABS MARIEMONT RIGID PAVEMENT LAB*
**LOCKBOURNE NO. 2, MODIFICATION MULTIPLE WHEEL STUDY.**
Rept. of Construction.
May 49, 77p.

Unclassified report

Descriptors: (*Landing fields, Pavements), (*Pavements, Construction), (*Test facilities, Pavements), Accelerated testing, Concrete, Reinforced concrete, Steel, Reinforcing materials, Substrates, Soils, Soil mechanics, Joints, Expansion joints, Analysis, Runways

The purpose of this report is to provide a complete record of the design features, construction details, and physical properties of the materials of construction and natural subgrade for the Lockborne pavement test tract.

**AD-628 359 Fld. 13/2, 1/5**
**CFSTI Prices: HC $23.40 MF $1.25**
*OHIO RIVER DIV LABS MARIEMONT RIGID PAVEMENT LAB*
**LOCKBOURNE TEST TRACK.**
Design and Construction rept.
Jun 44, 238p.

Unclassified report

Descriptors: (*Landing fields, Pavements), (*Pavements, Construction), (*Test facilities, Pavements), Runways, Accelerated testing, Concrete, Reinforced concrete, Steel, Reinforcing materials, Substrates, Soils, Soil mechanics, Joints, Expansion joints, Analysis, Data

The report presents a summary of the design and construction details of the full scale concrete pavement test sections and to assemble the results of field and laboratory tests made on the subgrade, base material and concrete, prior to and during construction. The first section of this report includes: the background for the tests, a resume of the general program, the details of design, the selection and description of the test site, the drainage of the site, and the selection and source of the materials of construction. The second section of this report describes the equipment and methods employed in constructing the test sections, and presents photographs to illustrate the various operation and completed construction. A set of revised drawings are included as Figures 2 to 5 inclusive showing the various features of the test track as constructed. The third section of this report summarizes the physical properties of the subgrades, bases and concrete as determined by field and laboratory tests. The complete test results on samples of the subgrade, base course materials, and concrete are included in Appendices 'A', 'B', and 'C'.

**AD-628 501 Fld. 13/2, 1/5**
**CFSTI Prices: HC $20.10 MF $1.25**
*HARVARD UNIV CAMBRIDGE MASS GRADUATE SCHOOL OF ENGINEERING*
**DEFLECTIONS AND STRESSES IN CONCRETE PAVEMENTS OF AIRFIELDS WITH CONTINUOUS ELASTIC JOINTS.**
Rept. for Sep 48-Jun 49,
by M. S. Skarlatos. Jun 49, 205p. Contract W-33-107-eng-4240,

Unclassified report

Descriptors: (*Runways, Loading (Mechanics)), (*Pavements, Stresses), (*Stresses, Pavements), Landing fields, Deflection, Expansion joints, Mathematical analysis, Numerical methods + procedures

The stresses and deflections of slabs investigated here are caused by loads. The load is a pressure transmitted through the 'footprint' of a tire of a landing gear. The load (or loads) is placed on a slab with a joint which is capable of transferring a part of the load to the adjacent slab. The joint between the two slabs is assumed to be elastic and continuous and to transfer the load by vertical shear without bending moments across the joint. Formulas are derived for stresses and deflections of the slabs on both sides of the joint, and for the transfer load, which lend themselves to numerical computations. The general assumptions are stated in common for all cases under investigation, then the order of presentation in each of the cases is: Summary of the formulas; derivations; and numerical examples.

**AD-628 548 Fld. 13/2, 8/12, 8/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF*
**ICE CONSTRUCTION: SURVEY OF EQUIPMENT FOR FLOODING.**
Technical rept.,
by C. R. Hoffman, and J. E. Dykins. Jan 66, 35p.
Rept. no. TR-R-402,
Proj. Y-F015-11-01-073,

Unclassified report

Descriptors: (*Ice islands, Construction), (*Hydrology, Ice islands), Floods, Levees, Pumps, Water, Freezing, Ice, Civil engineering

Two surface-flooding techniques for improving natural ice areas have been developed. Confined flooding, in which the flood is retained by natural boundaries and dikes, is used principally for filling and leveling thick natural ice areas. Free flooding, in which the outward flow of water is retained by freezing of the flood boundary, is generally used for accelerated thickening of relatively thin natural ice. This survey shows that adequate surface pumping units and flood distribution systems have been developed for confined flooding, and subsurface pumping units are being developed for free flooding. Mobile power-handling equipment is available for moving, lifting, and placing the pumps and other heavy gear required for ice construction, but the available man-handling gear for this work is less than adequate. Drills and augers are available for boring shallow holes in ice but not for deep holes. Electrical equipment and materials are available for cold-weather operation of single pump installations but systems for operating several pumps from a single power source have not been fully developed. Hot-air heaters, air compressors, chain saws, and other miscellaneous gear required for all types of ice flooding are available from commercial sources. It was concluded that continued development of the subsurface pumps and the necessary supporting equipment is needed to advance the techniques for leveling and strengthening natural ice areas. (Author)

**AD-628 692 Fld. 13/2, 1/5**
**CFSTI Prices: HC $23.10 MF $1.25**
*OHIO RIVER DIV LABS MARIEMONT RIGID PAVEMENT LAB*
**LOCKBOURNE NO. 3 PAVEMENT OVERLAY INVESTIGATION.**
Final rept.
May 51, 235p.

Unclassified report

Descriptors: (*Landing fields, Pavements), (*Pavements, Flexible structures), Substrates, Soil mechanics, Concrete, Asphalt, Expansion joints, Loading (Mechanics), Fracture (Mechanics), Performance (Engineering), Runways

The purpose of the investigation was to obtain data to aid in the formulation of criteria for the design of flexible pavements on a specially constructed concrete payment on a relatively plastic subgrade. The specific objectives were: (a) To determine, for the conditions at the test site, the thickness and type of flexible overlay required to produce a pavement adequate for capacity operation of planes weighing 120,000 pounds equipped with twin wheels as presently used on B-29 airplanes. (b) To determine the characteristics of the subgrade, concrete pavement and flexible pavement, to analyze the effects of traffic testing, and to aid in the formulation of design criteria. This program involved the testing of full scale pavement slabs by means of a traffic loading rig. The traffic loading rig consisted of a specially constructed unit producing a 60,000-pound load on twin 56 - inch x 23-inch airplane tires. The loading device simulated actual B-29 wheel loads, tire pressures and twin

wheel spacing. The test section consisted of 3, 6, 9 and 12-inch flexible overlay pavement on top of a 9-6-6-9-inch concrete pavement. The jointing of the concrete pavement was of conventional construction, expansion and contraction types.

**AD-628 837 Fld. 13/2, 1/5, 14/2**
**CFSTI Prices: HC $21.40 MF $1.25**
*OHIO RIVER DIV LABS MARIEMONT RIGID PAVEMENT LAB*
**LOCKBOURNE NO. 2, MODIFICATION MULTIPLE WHEEL STUDY.**
Final rept.
Jun 50, 218p.
Unclassified report

See also AD-628 290.

Descriptors: (*Landing fields, Pavements), (*Pavements, Performance (Engineering), Concrete, Runways, Loading (Mechanics), Degradation, Fracture (Mechanics), Test methods, Experimental data, Multiple operation, Landing gear

This investigation of heavy duty rigid pavement was conducted on a specially constructed test section at the Lockbourne Air Force Base near Columbus, Ohio, and forms an integral part of a series of such investigations conducted by the Rigid Pavement Laboratory, Ohio River Division Laboratories, Mariemont, Ohio, for the Office, Chief of Engineers. Construction of the test section was begun 13 August 1946 and was completed on 3 October 1946. The purpose of this investigation was to study the behavior of full-scale concrete pavement slabs under the traffic of multiple wheel loadings, to correlate this information with that already available for rigid pavement behavior under single sheel load traffic, and to establish or check methods of designing rigid pavements for multiple sheel loadings by airplanes having gross weights of 140,000 pounds and greater. In addition, other findings which appeared to be pertinent to the general problem of rigid pavement design are emphasized and discussed.

**AD-628 156 See Fld. 11/6**

**AD-628 279 See Fld. 13/13**

**AD-628 509 See Fld. 13/13**

## 13/3. CONSTRUCTION EQUIPMENT, MATERIALS AND SUPPLIES

**AD-628 139 See Fld. 13/13**

## 13/4. CONTAINERS AND PACKAGING

**AD-628 833 See Fld. 9/5**

**AD-628 877 See Fld. 13/8**

## 13/6. GROUND TRANSPORTATION EQUIPMENT

**AD-628 734 See Fld. 8/13**

## 13/7. HYDRAULIC AND PNEUMATIC EQUIPMENT

**AD-628 451 Fld. 13/7**
*CHARGED PARTICLE RESEARCH LAB UNIV OF ILLINOIS URBANA*
**AN APPARATUS TO STUDY THE COLLISION AND COALESCENCE OF LIQUID AEROSOLS,**
by J. M. Schneider, N. R. Lindblad, and C. D. Hendricks. 8 Feb 65, 8p. Contract AF-AFOSR-107-64 ,NSF-GP-2528
AFOSR 65-2498
Unclassified report

Prepared in cooperation with Illinois State Water Survey, Urbana.

*Availability: Published in Journal of Colloid Science v20 n6 p610-16 Aug 1965. Copies to DDC users only.*

Descriptors: (*Aerosols, Particle trajectories), (*Aerosol generators, Aerosols), Drops, Water, Charged particles, Particle size, Electrical equipment

An apparatus used to sudy collision and coalescence of liquid aerosols and some of the physical quantities enhancing or hindering these processes is described. The relative trajectories, collision, and coalescence of two oppositely charged water droplets are shown for the droplets approaching at right angles. The droplets were 96 microns and 79 microns in radius and had velocities at impact of 330 cm./sec. and 110 cm./sec., respectively. It was found extremely difficult to make the two droplets collide when both were highly charged with the same sign of charge. However, droplets highly charged with the opposite sign of charge had a high collision rate. (Author)

**AD-628 630 See Fld. 20/4**

## 13/8. INDUSTRIAL PROCESSES

**AD-628 070 Fld. 13/8, 13/10**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVY MARINE ENGINEERING LAB ANNAPOLIS MD*
**FEASIBILITY OF APPLICATION OF TITANIUM TO WIRE CABLE FABRICATION.**
Research and Development rept.,
by Warren F. Anderson. Feb 66, 15p. Rept. no. MEL-84/66,
Unclassified report

Descriptors: (*Titanium alloys, Feasibility studies), (*Cables (Mechanical), Materials), Wire, Cordage, Oceanographic equipment, Marine engineering

The state of the art for titanium alloy wire suitable for use in wire rope fabrication is reviewed. Although many activities in and out of the Navy have indicated an interest in titanium wire rope for marine applications, no such cable is commercially available. A broad development program for titanium alloy wire and wire rope is recommended. (Author)

**AD-628 170 Fld. 13/8, 9/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*HAMILTON STANDARD DIV UNITED AIRCRAFT CORP WINDSOR LOCKS CONN*
**ELECTRON BEAM TECHNIQUES FOR FABRICATION AND ASSEMBLY OF PARTS FOR ELECTRON TUBES.**
Quarterly rept. no. 9, 1 Jul-30 Sep 65,
by N. H. Ballard. 30 Sep 65, 44p. Rept. no. EBR-177,
Contract DA-36-039-AMC-03625 (E)
Unclassified report

See also AD-625 479.

Descriptors: (*Electron tube parts, Manufacturing methods), (*Welding, Electron beams), (*Machining, Electron beams), (*Electron beams, Manufacturing methods), Electron tubes, Acceptability, Military requirements

The program objectives and a concise summary of the program history are presented. Progress during this reporting period relevant to manufacturing and evaluating preproduction 6914 tubes and pilot line 6544 tubes is discussed. Proposed objectives for the tenth reporting period are outlined. (Author)

**AD-628 664 Fld. 13/8, 11/2, 9/1**
**CFSTI Prices: HC $1.60 MF $0.50**
*NAVAL AVIONICS FACILITY INDIANAPOLIS IND*
**THE PERFORMANCE OF SIO SOURCE (NAFI IF-1008) IN SINGLE-CHAMBER VACUUM SYSTEMS.**
Interim technical rept. Nov 64-Mar 65,
by W. C. Underwood. 13 Dec 65, 15p. Rept. no. NAFI-TR-678A
NAFI TR-678-superseded
Unclassified report

Descriptors: (*Dielectric films, Deposition), (*Silicon compounds, Evaporation), (*Vapor plating, Silicon compounds), Monoxides, Films, Vacuum apparatus, Effectiveness

An evaporation source for deposition of silicon monoxide thin films was reported to possess high raw material capacity and high evaporation rate characteristics. The source design was evaluated in two different laboratory bell jar vacuum systems and was found to be unsatisfactory. (Author)

**AD-628 877 Fld. 13/8, 13/4**
*GIBBS LAB YALE UNIV NEW HAVEN CONN*
**TECHNIQUE FOR FORMING PRESSURE WINDOWS FROM THIN METAL SHEETS.**
Revised ed.,
by W. E. Cleland, and R. Prepost. 8 Sep 65, 2p.
Unclassified report

Revision of manuscript received 15 Mar 65. Prepared in cooperation with High Energy Physics Lab., Stanford Univ., Calif., Rept. no. HEPL-427. Research supported in part by AFOSR, ARPA and NONR.

*Availability: Published in Review of Scientific Instruments v36 n12 p1881-3 1965. Copies to DDC users only.*

Descriptors: (*Pressure vessels, Diaphrams (Mechanics)), (*Diaphrams (Mechanics), Sheets), (*Material forming, Diaphrams (Mechanical)), Aluminum alloys, Stainless steel, Thickness, Fracture (Mechanics)

**AD-628 064 See Fld. 11/7**

**AD-628 128 See Fld. 9/1**

**AD-628 185 See Fld. 11/3**

**AD-628 225 See Fld. 9/1**

**AD-628 230 See Fld. 9/1**

**AD-628 280 See Fld. 14/2**

**AD-628 284 See Fld. 11/6**

**AD-628 300 See Fld. 14/2**

**AD-628 337 See Fld. 9/1**

**AD-628 399 See Fld. 11/9**

**AD-628 575 See Fld. 10/3**

**AD-628 577 See Fld. 9/1**

**AD-628 618 See Fld. 9/1**

**AD-628 839 See Fld. 15/5**

## 13/9. MACHINERY AND TOOLS

**AD-628 052 Fld. 13/9**
**CFSTI Prices: HC $3.00 MF $0.50**
*SKF INDUSTRIES INC KING OF PRUSSIA PA RESEARCH LAB*
**A BASIC STUDY OF THE SLIDING CONTACTS IN ROLLING BEARINGS.**
Progress rept. no. 3 on Proj. 11, 17 Oct 65-16 Jan 66,

by C. J. Belsky, C. G. Hingley, J. A. Kamenshineand , and W. E. Schmidt. 16 Jan 66, 52p. Rept. no. AL66L011,
Contract NOw-65-0182-f, Proj. SKF-18-7 ,SKF-19-1

Unclassified report

See also AD-623 665.

Descriptors: (*Roller bearings, Mechanics), (*Friction, Roller bearings), Loading (Mechanics), Velocity, Lubricants, Surface properties, Cylindrical bodies, Motion, Tests, Mineral oils

During the present reporting period the work continued with a study of the torque calibration of the stationary ball support under a range of contact loads. The unexpected nature of this relationship has led to a more detailed study of the stiffness of the machine.

**AD-628 064 See Fld. 11/7**

## 13/10. MARINE ENGINEERING

**AD-628 092 Fld. 13/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C HYDROMECHANICS LAB*
**TMB 3-BLADED SUPERCAVITATING PROPELLER SERIES,**
by E. B. Caster. Aug 59, 29p.
DTMB 1245

Unclassified report

Descriptors: (*Propellers (Marine), Performance (Engineering)), Cavitation, Design, Mathematical prediction, Fluid dynamic properties

A theoretical series of 3-bladed supercavitating propellers, having a hub radius of 0.2 of the propeller radius and an expanded area ratio of 0.5, is presented. The design parameters for these propellers are plotted in the form of nondimensional coefficients which enable a complete design to be obtained. (Author)

**AD-628 097 Fld. 13/10, 11/9, 7/3**
**CFSTI Prices: HC $6.00 MF $1.25**
*DEPARTMENT OF THE NAVY WASHINGTON D C*
**POLYESTER GLASS PLASTICS FOR SHIPBUILDING,**
by I. M. Alshits. 1966, 260p. Rept. no. Translation-1036,
TT 66-60550

Unclassified report

Trans. of mono. Sudostroenie, Leningrad, 1964 n. p.

Descriptors: (*Polyester plastics, Ship hulls), (*Ship hulls, Polyester plastics), Glass textiles, Reinforcing materials, Ship structural components, Composite materials, Processing, Chemistry, Handbooks, Binders, USSR

The book presents general information concerning glass plastics, primarily the polyester glass plastics used in shipbuilding. Reviewed are the methods for obtaining the raw materials, their properties, and methods for analyzing them, the resins and glass fiber products, as well as the chemical technology involved in manufacturing glass plastics from them. Particular attention has been given to safety and labor hygiene.

**AD-628 193 Fld. 13/10, 14/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*DEPARTMENT OF THE NAVY WASHINGTON D C*
**MODEL TESTS OF ELECTROCHEMICAL PROTECTION AGAINST CORROSION OF SHIPS' HULLS AND DETERMINATION OF EFFECT OF PROPELLERS ON THE CONDITIONS OF FUNCTIONING OF THIS PROTECTION,**
by L. A. Suprun, V. P. Bardina, and A. A. Vysotskii. 1966, 30p. Rept. no. Translation-2063,
TT 66-60556

Unclassified report

Modelnye Ispytaniya Elektrokhimicheskoi Zashchii Korpusov Morskikh Sudov ot Korrozii i Opredelenie Vliianiya Grebnogo Vinta na Rezhimy Raboty Etoi Zashchity, Proceedings of the Central Scientific -Research Inst. for the Merchant Marine, issue no. 57, p3-25 1964.

Descriptors: (*Ship hulls, Cathodic protection), (*Cathodic protection, Model tests), Test methods, Tests, Electrochemistry, Propellers (Marine), Varnishes, Coatings, Electrodes, Corrosion inhibition, USSR

This article discusses the methodology of model tests of electrochemical protection and the nature of distribution of potential over the hull of a ship with different versions of protection and cathode shields. The expediency of using these devices in combination with lacquer paint coatings is demonstrated. On the basis of theoretical and experimental investigations, recommendations are made for appraisal of the effect of the propeller during design of an electrochemical protection system for the submerged parts of ships' hulls.New methods of shielding, sizes and distances of anodes or protectors, the effect of lacquer paint coatings, ship's propeller, etc, were quickly and easily checked during model tests which were done as part of an overall research program. Propellers are made of copper alloys or stainless steels and, in the two electrode system 'hull-propeller', they are a cathode and exert a vital influence on the corrosion of the outside layer of the stern section of the hull, as well as on conditions for electrochemical shielding. (Author)

**AD-628 440 Fld. 13/10, 14/2**
**CFSTI Prices: HC $4.60 MF $0.50**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C HYDROMECHANICS LAB*
**TESTING SHIP MODELS IN TRANSIENT WAVES,**
by M. C. Davis, and Ernest E. Zarnick. Jan 66, 49p. Proj. S-R009-01-01, Task 0100,
DTMB 2128

Unclassified report

Presented at the Symposium on Naval Hydrodynamics (5th), Bergen, Norway, 10-12 Sep 1964.

Descriptors: (*Ships, Model tests), (*Model tests, Test methods), Water waves, Motion, Pitch (Motion), Theory, Mathematical analysis, Model basins, Ship models, Integral transforms

The seaworthiness characteristics of a ship design are often determined by a series of model tests in regular waves. This report describes a new model test procedure which makes use of a transient wave disturbance having energy distributed over all wave lengths of interest. With the use of this transient wave technique, the testing time required to characterize a model is reduced by an order of magnitude. In this report, the basic behavior of a unidirectional transient wave is discussed, and a simple Fourier transformation is developed to link wave height records measured at any two separated points along the path of such a wave. A particular form of transient wave, which is approximately sinusoidal with linearly varying frequency, has been used to test successfully a number of ship models. The results of these tests are presented and the practical problems in generating, measuring, and analyzing transient wave tests are discussed. (Author)

**AD-628 441 Fld. 13/10**
**CFSTI Prices: HC $5.60 MF $0.50**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C ACOUSTICS AND VIBRATION LAB*
**CALCULATED NATURAL FREQUENCIES AND NORMAL MODES OF THE GUIDED MISSILE CRUISER USS LONG BEACH (CG (N)-9).**
Research and development rept.,
by Donald C. Robinson. Jan 66, 51p. Proj. S-F013-11-08, Task 01351,
DTMB 2100

Unclassified report

Descriptors: (*Ship hulls, Vibration), (*Cruisers, Vibration), (*Marine engineering, Cruisers), Guided missiles, Naval vessels (Combatant), Ship structural components, Propulsion

Calculations were performed to determine the first six modes of vertical and horizontal flexural vibration, the first three modes of torsional vibration, and the first five modes of coupled torsion-horizontal bending vibration for the guided missile cruiser USS LONG BEACH (CG (N)9) at a displacement of 16,103 tons. A calculation coupling propulsion system longitudinal vibration with vertical flexural hull vibration was performed on an electrical analog computer in an attempt to simulate the excitation of flexural hull modes by vibratory forces transmitted longitudinally through the propulsion-shafting system. Flexural calculations of hull horizontal vibrations were performed with the large forward superstructure deckhouse considered both as rigidly and flexibly attached to the hull. Included in the results are the hull response to a sinusoidal force of 1000 lb acting at the stern in a vertical direction. The vertical flexural modes and natural frequencies were computed using both the standard two-node Lewis virtual mass coefficient and a varaible virtual mass coefficient. The parameters used for the calculations are discussed in detail. Results of the calculations are compared with measured hull frequencies. (Author)

**AD-628 555 Fld. 13/10, 20/4**
**CFSTI Prices: HC $2.60 MF $0.50**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C HYDROMECHANICS LAB*
**RESISTANCE AND EHP OF A 'FOIL-MARAN' CONFIGURATION AS PREDICTED FROM SMOOTH WATER TESTS OF MODEL 4836-3.**
Research and development rept.,
by Lawrence Benen. Dec 65, 21p. Proj. S-F014-02-02, Task 2062,
DTMB 2118

Unclassified report

Descriptors: (*Hydrofoil boats, Model tests), (*Catamarans, Model tests), Hydrofoils, Hydrodynamics, Marine engineering

A model of a catamaran planing boat was equipped with a diamond-shaped surface-piercing hydrofoil to eliminate instabilities encountered with an earlier foil configuration (TMB Report 1852). The hydrofoil configuration was located forward of the center of gravity, and two high deadrise planing surfaces integral with the hull were located aft of the center of gravity. Smooth water resistance tests were made with various LCG locations; and with the foils at various angles of attack and various fore and aft positions, to determine an optimum configuration. Model speed, resistance, trim, and wetted length were measured throughout the speed range for a number of foil positions, foil angles, and hull trims. The best condition from a stability and resistance standpoint was then expanded to full scale. The results for the optimum configuration are presented in dimensionless form and also in the form of trim and ehp versus full-scale speed in knots. R/delta comparisons are also made for the foil-maran, the parent catamaran hull, and a conventional planing hull. At high speed the resistance of the foil-maran was less than that of the catamaran. However, the resistance of the foil-maran was considerably greater than that of the conventional planing hull at all speeds. (Author)

**AD-628 774 Fld. 13/10**
**CFSTI Prices: HC $1.60 MF $0.50**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C ACOUSTICS AND VIBRATION LAB*
**FORCES ON A SUBMARINE HULL INDUCED BY THE PROPELLER,**
by George Chertock. Dec 65, 13p.
DTMB 2117
Unclassified report

Descriptors: (*Propellers (Marine), Submarine hulls), (*Submarine hulls, Force (Mechanics)), Vibration, Pressure, Thrust, Fluid flow, Mathematical analysis

The induced-flow field generated by a propeller operating in the wake of a submarine can exert forces on the submarine in some arbitrary made of motion in two ways: Either by pressures applied to the propeller blades and resulting in the conventional propeller thrust or by pressures applied to the hull surface. The ratio of these forces is shown, by theoretical analysis, to depend most strongly on the flow velocity which the particular hull mode of motion would generate at the propeller, to be slightly dependent on the shape of the propeller, and to be negligibly dependent on the magnitude or distribution of the submarine wake. The derived relations are valid for both the inertial and quasi-steady components of the induced-pressure field. The predominant factor in the force ratio is evaluated by a numerical technique which is applicable to any surface of revolution moving in almost any pattern of motion. As one application, it is shown that the steady longitudinal force on the hull is 8 to 12 percent of the steady component of the propeller thrust, in good agreement with measurements of the thrust-deduction factor. As another application, it is shown that a particular vibratory component of the hull force, tending to vibrate the hull in the accordion-vibration mode, is 6 to 8 percent of the same component of the propeller thrust. (Author)

**AD-628 831 Fld. 13/10, 1/3**
**CFSTI Prices: HC $1.60 MF $0.50**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C AERODYNAMICS LAB*
**CALM-WATER RESISTANCE CHARACTERISTICS OF A 25-PERCENT-SCALE MODEL OF A HYPOTHETICAL CAPTURED AIR BUBBLE (CAB) LANDING VEHICLE.**
Final rept.,
by Martin D. Fink. Jan 66, 18p. Rept. no. Aero-1102,
DTMB 1882
Unclassified report

Descriptors: (*Ship hulls, Landing craft), (*Ground effect machines, Landing craft), (*Landing craft, Ship hulls), Hydrofoils, Hydrofoil boats, Hydrodynamics, Drag, Stability, Weight, Center of gravity

Resistance data are presented for a simulated Captured Air Bubble (CAB) landing vehicle configuration operating over calm water. This particular CAB configuration uses a flexible, fabric bow seal instead of the more usual planing ski. Two center-of-gravity positions are considered and comparison is made with the performance of a hydrofoil vehicle of the same size. General indications are that minor changes in center-of-gravity location can have considerable effect on the vehicle trim attitude and performance. Also, in terms of drag-to-weight ratio, the over-all performance of the CAB configuration exceeds that of the hydrofoil configuration at normal mission operating speeds. However, the CAB configuration tested would not have adequate stability in roll. (Author)

**AD-628 854 Fld. 13/10**
**CFSTI Prices: HC $4.60 MF $0.50**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C HYDROMECHANICS LAB*
**CAVITATION TESTS OF A TRACTOR PROPELLER ARRANGEMENT FOR THE PC (H),**
by James G. Peck. Jan 66, 41p. Proj. SCN-47009,
DTMB 2154
Unclassified report

Descriptors: (*Hydrofoil boats, Propellers (Marine)), (*Propellers (Marine), Cavitation), Test methods, Models (Simulations), Performance (Engineering), Submarine chasers, Water tunnels

Three tractor propellers, designed for PC (H), were tested on the PC (H) model configuration in the TMB 36-inch variable pressure water tunnel. Cavitation characteristics, thrust deduction curves, and sketches of the cavitation of each propeller were obtained. Of the three propellers tested, only one was more efficient than a previously tested tandem propeller arrangement. (Author)

**AD-628 070** **See Fld. 13/8**

**AD-628 194** **See Fld. 11/3**

**AD-628 196** **See Fld. 11/3**

**AD-628 838** **See Fld. 11/8**

**AD-628 839** **See Fld. 15/5**

**AD-628 867** **See Fld. 13/13**

## 13/10.1 SUBMARINE ENGINEERING

**AD-628 442** **See Fld. 20/4**

## 13/11. PUMPS, FILTERS, PIPES, TUBING AND VALVES

**AD-628 235 Fld. 13/11, 21/5**
**CFSTI Prices: HC $2.60 MF $0.50**
*DONALDSON CO INC MINNEAPOLIS MINN RESEARCH AND DEVELOPMENT DIV*
**AUTOMATICALLY CLEANED FILTER FOR 3400 CFM GAS TURBINE.**
Interim technical rept. no. 1, 1 Sep 64-1 Dec 65, 1 Dec 65, 22p. Contract DA-44-009-AMC-777 (T), Proj. DA-1D643324D59002,
Unclassified report

Descriptors: (*Gas filters, Gas turbines), Automatic, Cleaning, Design, Mechanical drawings, Performance (Engineering)

The report concerns the development of an automatically cleaned filter for 3400 cfm gas turbine application. The design and fabrication of a performance model air cleaner is a continuation of earlier development effort started under contract DA-44-009-ENR-5262 which investigated performance of flatsheet media under reverse airflow cleaning conditions. The performance model; consisting of a housing, filter element, cleaning nozzles, and a drive and control system; successfully demonstrates the practability of the self-cleaning concept applied to high airflow systems. This report presents the basic design concepts with supporting data for selection of components for the performance model air cleaner. (Author)

**AD-628 380** **See Fld. 14/2**

## 13/12. SAFETY ENGINEERING

**AD-628 783 Fld. 13/12, 18/3**
**CFSTI Prices: HC $4.00 MF $0.75**
*SOUTHWEST RESEARCH INST SAN ANTONIO TEX*
**THE USE OF MODELS FOR THE INVESTIGATION OF FIRE SPREAD.**
Final rept.,
by Lester A. Eggleston, Andrew J. Pryor, W. D. Weatherford Jr., and Calvin H. Yuill. 10 Feb 66, 116p. Contract DA-49-146-XZ-346, Proj. SwRI-03-1684, Task 12.024, DASA 1725
Unclassified report

Descriptors: (*Fires, Model tests), (*Buildings, Models (Simulations)), (*Models (Simulations), Fires), Flame propagation, Nuclear explosions, Combustion, Burning rate, Electronic equipment, Simulators

Previous work on the development of models of buildings for use in the study of mass fires and fire spread was continued. The current study of combustible models extends the size limits utilized, considers the effect of differing materials and of the total fire load, and develops a new analysis of buoyancy-controlled flames. A prototype electronic mass fire simulator was developed further and 200 complete units fabricated together with auxiliary equipment necessary to construct an area fire representation. Preliminary tests of the simulator demonstrated capability to the extent of reproducing a specific area fire within a reasonable degree of accuracy. A number of area fires were reviewed and three selected for intensive investigation. Sufficient information was obtained on these three to provide a basis for calibrating the electronic mass fire simulator and to extend existing knowledge on the manner in which fire spreads between buildings. (Author)

## 13/13. STRUCTURAL ENGINEERING

**AD-628 050 Fld. 13/13, 14/2, 11/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB OHIO*
**INFLATABLE STRUCTURE TEST PROGRAM.**
Final rept.,
by John B. Monfort. Dec 65, 33p. Rept. no. AFFDL-TR-65-181,
Proj. AF-1370, Task 137003,
Unclassified report

Descriptors: (*Inflatable structures, Model tests), (*Model tests, Inflatable structures), Metallic textiles, Stainless steel, Wire, Elastomers, Coatings, Silicones, Wind tunnels, Wind tunnel models, Flight-temperature research, Test methods

Small specimen tests (elevated temperature with internal pressure) were performed to predict the ability of a CS-105 silicone elastomer coated AIRMAT model to withstand the environment of a hypersonic wind tunnel (900-15001F). The specimens all leaked badly in the expected wind tunnel temperature range. This indicated the probability of subsequent model failure. The wind tunnel model tests were successful however. Influence coefficient and vibration tests, both at room and elevated temperatures, were performed on AIRMAT models in support of flutter research. As before, the models could not withstand elevated temperature (8001F or above). The laboratory model inflation pressure was 10 psi compared with the wind tunnel model inflation pressure of about 2 psi. Time at temperature and/or an oxidizing atmosphere could be failure factors. Further testing of CS-105 coated AIRMAT structures is needed to evaluate the influence of load, pressure, temperature, and environment on coating characteristics and wire strength. (Author)

**AD-628 063 Fld. 13/13**
**CFSTI Prices: HC $4.00 MF $1.00**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CIVIL ENGINEERING*
**DYNAMIC TESTS OF MODEL STEEL STRUCTURES.**
Final rept., 18 Mar 64-30 Nov 65,
by Wayne L. Stewart, Pierce E. Rowe, and Peter Jan Pahl. Nov 65, 140p. Rept. no. R-65-32, DSR-5135

Contract NBy-32267, Proj. Y-F008-08-02-126B
Unclassified report

Descriptors: (*Structures, Model tests), (*Models (Simulations), Structures), (*Steel, Structures), Beams (Structural), Loading (Mechanics), Tensile properties, Strain (Mechanics), Structural parts, Mathematical analysis, Test equipment, Test methods

The objective of the research project was the development of modelling techniques for steel structures and an investigation of the effect of strain rate on the resistance function of structural elements. The work proceeded in four phases: a dynamic loading machine was developed, dynamic material properties were determined in a series of tensile tests, 16 static and dynamic tests were performed on simply supported beams loaded at the third points, and a series of 16 static and dynamic tests were performed on fixed ended portal frames subjected to a lateral load at the level of the girder. The dynamic loading machine is capable of rise times of 3 milliseconds or more and maximum loads of 2000 pounds. It can also be used as a static loading machine. Generally, it is concluded that model studies of steel structures provide an excellent experimental tool. Very sensitive tests for the investigation of strain rate effects have been developed. The necessary apparatus and techniques have been refined and initial difficulties eliminated so that a large number of additional tests on models with a variety of geometric configurations and material properties could be performed rapidly and reliably. These tests might significantly extend our understanding of the dynamic behavior of steel structures. (Author)

**AD-628 139 Fld. 13/13, 13/3**
**CFSTI PricesMF $1.00**
*BUREAU OF RECLAMATION DENVER COLO*
**REINFORCED CONCRETE. DESIGN DATA,**
by L. W. Crandall, George Evans, Erik Sollid, H. L. Neve, and Samuel Judd. Oct 52, 152p. Rept. no. Engineering mono-10,
Unclassified report

*Availability: Available from Bureau of Reclamation, Denver Federal Center, Denver, Colorado and Washington, D. C. $1.35.*

Descriptors: (*Reinforced concrete, Civil engineering), (*Civil engineering, Reinforced concrete), Beams (Structural), Design, Mathematical analysis, Structures, Data, Statics, Moments, Distribution, Loading (Mechanics)

Many engineering organizations are frequently required to design concrete frame structures, such as powerhouse superstructures and valve houses, in which heavy-duty overhead cranes pose difficult design problems. Practically all such structures are designed as rigid frames, and are statically indeterminate. This monograph is confined to deriving data necessary for designing reinforced-concrete structures of this type, but the method can be extended to apply to any statically indeterminate structure. Chapter I discusses the determination of beam constants for frequently occurring variable sections, Chapter II discusses moment distribution, including sidesway, and Chapter III contains a collection of design diagrams for reinforced-concrete members. Derivation of equations is shown in Appendices A and B.

**AD-628 279 Fld. 13/13, 20/11, 13/2**
**CFSTI Prices: HC $6.00 MF $1.25**
*AIR FORCE MATERIALS LAB WRIGHT-PATTERSON AFB OHIO*
**SOME ASPECTS OF THE ANALYSIS OF DAMPING AND VIBRATIONS IN SIMPLE STRUCTURES.**
Summary rept. Oct 64-Apr 65,
by D. I. G. Jones. Dec 65, 255p. Rept. no. afml-TR-65-151,
Proj. AF-7351, Task 735106,
Unclassified report

Descriptors: (*Structures, Damping), (*Damping, Structures), Mathematical analysis, Beams (Structural), Metal plates, Vibration, Theory, Sandwich panels, Viscoelasticity, Equation of motion, Vibration isolators, Design

While no particular claim to completeness is made, this monograph represents an attempt to summarize, within one volume, the various structural damping techniques that have been developed in recent years. Included, for example, are discussions of unconstrained layer treatments, sandwich panels, viscoelastic tuned dampers and a new corrugated treatment. Certain fundamentals of the theory of vibration in general, necessary to complete understanding of the subject of damping, are included in appendices. (Author)

**AD-628 289 Fld. 13/13, 19/4**
**CFSTI Prices: HC $11.60 MF $0.75**
*BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD*
**A FAILURE CRITERION FOR BLAST LOADED CYLINDRICAL SHELLS,**
by William J. Schuman Jr., May 65, 117p. Rept. no. BRL-1292,
Proj. RDT and E-1P014501A33E
Unclassified report

Descriptors: (*Structural shells, Failure (Mechanics)), Terminal ballistics, Cylindrical bodies, Loading (Mechanics), Blast, Explosion effects, Vulnerability, Plasticity, Deformation

The results of an extensive experimental program to study the plastic response of thin-walled, unstiffened cylindrical shells to external blast loading are presented. Empirical relations between the shell and blast parameters that satisfy a failure criterion based on a given level of plastic deformation are given. A comparison of calculated and actual overpressure values for 159 shells that had responses satisfying the failure criterion (permanent deformation in the radial direction - 5 percent to 10 percent of the original diameter) is made. The average deviation between these values is 14 percent. (Author)

**AD-628 509 Fld. 13/13, 13/2**
**CFSTI PricesMF $0.75**
*UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO MEXICO INSTITUTO DE INGENIERIA*
**ULTIMATE LOADS OF A CLASS OF SHELLS OF MATERIAL WITH NON-LINEAR BEHAVIOR,**
by Emilio Rosenblueth, and Jorge I. Bustamante. Aug 65, 111p. Contract DA-ARO-49-092-64-G59,
Unclassified report

Descriptors: (*Structures, Loading (Mechanics)), (*Loading (Mechanics), Dams), Mathematical programming, Programming (Computers), Model theory, Mexico

From this study it is concluded that the estimate of the ultimate load of arch dams, similar to the ones tested, with the method proposed gives a close lower bound to the maximum service load of the dam. The method is simple and can be applied even with a desk calculator once the curvatures are known. When the vertical curvature is disregarded, as recommended for some elastic analyses, there is a small error in the estimate of the ultimate load; for the cases presented, this error was less than 18 percent. The method as given here is completely automatic because one knows in advance where the critical sections lie, so that, if equilibrium is verified there, it necessarily holds for the entire structure. However the method is general and one should merely specify any statically feasible field to obtain the corresponding load. A similar although much more elaborate approach can be applied if the differential equations of equilibrium are known. From them one obtains the difference equations and sets up a mathematical programming problem. When proceeding thus, there is the advantage of generality over the method proposed but the techniques are more cumbersome and not justified for the types of problems presented. (Author)

**AD-628 545 Fld. 13/13, 11/12**
*YALE UNIV NEW HAVEN CONN SCHOOL OF FORESTRY*
**SHEAR DEFLECTION OF WOOD BEAMS.**
Technical rept.,
by E. J. Biblis. Nov 65, 8p. Rept. no. TR-32,
Contract Nonr-609 (13), Proj. NR-330-001,
Unclassified report

*Availability: Published in Forest Products Journal v15 n11 p492-8 Nov 1965. Copies to DDC users only.*

Descriptors: (*Wood, Beams (Structural)), (*Beams (Structural), Loading (Mechanics)), Deflection, Bending, Shear stresses, Deformation, Elasticity, Mathematical analysis

The present paper, using data collected in previous studies, shows the relative contribution of shear deflection to the total deflection of rectangular wood beams of several species. It demonstrates, furthermore, how the amount of shear deflection is affected by the ratio of pure modulus of elasticity to modulus of rigidity of the species, and by the span-to-depth ratio of the beam.

**AD-628 806 Fld. 13/13, 20/11**
**CFSTI Prices: HC $5.00 MF $1.25**
*IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER*
**EXPERIMENTAL STUDY OF STRESS WAVE INTERACTION IN PHOTOVISCOELASTIC PLATES.**
Rept. for 1 Oct 63-5 Feb 65,
by I. M. Daniel. Jan 66, 200p. Rept. no. M-6069,
Contract AF 29 (601)-6240, Proj. AF-5710, Task 13.148,
AFWL TR-65-43
Unclassified report

Descriptors: (*Underground structures, Mechanical properties), (*Protective coverings, Underground structures), Nuclear explosions, High pressure research, Soils, Simulation, Polyvinyl chloride, Creep, Photoelasticity, Viscoelasticity, Loading (Mechanics), Falling bodies, Shock waves, Shock tubes, Stresses, Strain (Mechanics), Soil mechanics, Theory

The objective of this investigation is to obtain experimental solutions to viscoelastic stress wave interaction problems pertinent to the design of protective structures. The methods of photoviscoelasticity and experimental viscoelasticity in general were employed. The model material used, plasticized polyvinyl chloride, was characterized mechanically and optically by creep tests at different temperatures using the temperature-time equivalence principal and by sinusoidal oscillation tests. Good agreement was obtained by the two methods of property determination. Photoviscoelastic plates were subjected to falling weight and air shock loadings. In the falling weight loading, stresses were determined on the boundary of a circular hole and at a similarly located point in the free field. It was found that the measured maximum compressive stress on the hole boundary is up to 17 percent higher than that obtained by using the free-field stresses and static stress concentration factors. In the air shock loading, stresses were determined at a free-field point and on the boundaries of circular hole and a rigid circular inclusion. The maximum compressive stress on the hole boundary is appreciably higher than the 'statically' computed stress initially, but approaches it at later times. In the case of the rigid inclusion, differences of up to 25 percent between dynamic and 'static' stresses were found. (Author)

**AD-628 867 Fld. 13/13, 20/4, 13/10**
**CFSTI Prices: HC $3.00 MF $0.75**
*ARMY COASTAL ENGINEERING RESEARCH CENTER WASHINGTON D C*
**ANALYSIS OF WAVE PRCES ON A 30-INCH DIAMETER PILE UNDER CON SED SEA CONDITIONS.**
Technical memo.,
by B. W. Wilson. Oct 65, 91p. Rept. no. TM-15,
Unclassified report

Descriptors: (*Hydrodynamics, Foundations (Structures)), (*Marine engineering, Foundations (Structures)), (*Foundations (Structures), Hydrodynamics), (*Water waves, Hydrodynamics), Mexico Gulf, Drilling machines, Force (Mechanics), Numerical analysis

This paper discusses methods that were developed in the period 1955-1957 in the analysis of wave force measurements on a 30-inch diameter test pile in a water depth of 40 ft. in the Gulf of Mexico. Procedures for reducing the raw data to a form suitable for digital computer operations are outlined. Measurements of wave elevation eta (t) at the pile, obtained by motion picture camera, were successfully checked with measurements of vertical reaction R sub z (t) on the double-hinged pile, suitably adjusted by a numerical frequency response operator technique. Numerical filter techniques were used to erase unwanted vibrational frequencies from the records and frequency response operators used also to derive horizontal velocity and acceleration components (at the level of action of total force) from the records of eta (t). (Author)

**AD-628 285** **See Fld. 13/2**

**AD-628 668** **See Fld. 11/4**

# Field 14-METHODS AND EQUIPMENT

## 14/1. COST EFFECTIVENESS

**AD-628 099 Fld. 14/1, 15/5, 12/2**
**CFSTI Prices: HC $6.60 MF $0.75**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**A COST ESTIMATING RELATIONSHIP FOR PETROLEUM-OIL-LUBRICANTS COSTS.**
Master's thesis,
by Carl D. Miller. Aug 65, 61p. Rept. no. GSM/SM/65-15,
Unclassified report

Descriptors: (*Costs, Logistics), (*Mathematical models, Costs), (*Fuel consumption, Jet fighters), (*Lubricants, Jet fighters), Management planning, Air Force

One method of cost estimation is by the use of cost estimating relationships. A cost estimating relationship is an equation, with one dependent variable and one or more independent variables. The independent variables are usually characteristics of the system for which the estimate is made. A cost estimating relationship was needed for average fuel and oil co ts per flying hour for jet fighter type aircraft. Two suitable cost estimating relationships were derived through regression analysis using data for nine different jet fighter aircraft. Linear, curvilinear, and multiple regression analyses were used with two linear relationships being selected. These relationships are: X sub 1 = 10.51 + .00189X sub 2 with X sub 2 being take-off weight--basic mission and X sub 1 = 21.99 + .00461X sub 2 with X sub 2 being military thrust. Tests for correlation and prediction interval yielded satisfactory results. The estimating relationships have limitations on their use for aircraft with very high take -off weight or very high thrust. The estimate obtained from the relationship must be adjusted for differences in fuel and oil prices from January 1964 prices. Further research is needed in this cost estimating area. (Author)

**AD-628 102** **See Fld. 14/4**

## 14/2. LABORATORIES, TEST FACILITIES, AND TEST EQUIPMENT

**AD-628 280 Fld. 14/2, 13/8, 9/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*CTS CORP ELKHART IND RESEARCH AND DEVELOPMENT DIV*
**PRODUCTION ENGINEERING MEASURE FOR SUBMINIATURE, TRANSISTOR TYPE POTENTIOMETERS.**
Quarterly progress rept. no. 17, 1 Jul-30 Sep 65,
by C. L. Holmes, and D. C. Kinsey. 30 Sep 65, 12p. Contract DA-36-039-sc-85976,
Unclassified report

See also AD-621 355.

Descriptors: (*Potentiometers, Manufacturing methods), (*Subminiature electronic equipment, Potentiometers), Transistors, Production control Specifications, Reliability (Electronics), Life expectancy, Test methods, Tests

Technical Action Request No. 8 was submitted to request changes in test requirements. These requested changes were denied. After reviewing the entire project, the decision was made to rebuild the 300 controls as proposed in Action H, TAR No. 8. Fabrication of the 300 controls was begun and a new time table was submitted to the Signal orps for approval.

**AD-628 300 Fld. 14/2, 13/8**
**CFSTI Prices: HC $1.10 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**METHOD OF MEASURING THE TEMPERATURE OF OBJECTS OF DIFFICULT ACCESS AT TIME OF OPERATION,**
by S. I. Alekseev, V. I. Kapukhin, and V. A. Nikolaenko. 5 Nov 65, 6p. Rept. no. FTD-TT-64-970,
TT 66-60576
Unclassified report

Unedited rough draft trans. of Patent (USSR) 160339, appl. 809808/26-10, 24 Dec 62.

Descriptors: (*Temperature, Measurement), (*Temperature sensitive elements, Diamonds), (*Diamonds, Thermal expansion), X-rays, Test equipment, Hightemperature research, USSR

The proposed method broadens the possibilities of the measurements of the temperature of objects, which are of difficult access at the time of operation. This ia attained through the fact that at the place that is to be checked, one places a radiated diamond, and then one judges of the value for the maximum temperature by the curve of the isothermic expansion of the radiated diamond or by the point of the breakdown of the dependence of the expansion of the radiated diamond on the temperature of firing. (Author)

**AD-628 310 Fld. 14/2**
**CFSTI Prices: HC $59.10 MF $2.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**MEASURING DEVICES,**
by L. S. Kuznetsova, and A. E. Matveeva. 24 Sep 65, 595p. Rept. no. FTD-TT-65-314,
TT 66-60584
Unclassified report

Unedited rough draft trans. of mono. Izmeritelnyi Instrument, Moscow, 1963 488p.

Descriptors: (*Measurement, USSR) (*Meters, USSR), Standards, Measuring devices (Electrical + electronic)

The 'Measuring Devices' handbook has been compiled by the State Standard Publishing House and includes standards effective on May 1, 1963. Due to the fact that standards are regularly revised and revisions are introduced, the standards should be checked when using the handbook to find out whether there have been any revisions. Standards which have the * sign at the number include all introduced revisions as of May 1, 1963. (Author)

**AD-628 369 Fld. 14/2**
**CFSTI Prices: HC $3.00 MF $0.50**
*VIRGINIA UNIV CHARLOTTESVILLE RESEARCH LABS FOR THE ENGINEERING SCIENCES*
**THE DEVELOPMENT OF AN ELECTRIC FIELD METER TO MEASURE SMALL VARIATIONS IN THE EARTH'S FIELD,**
Final rept.,
by H. D. Browning, and R. S. Snyder. Mar 65, 53p. Rept. no. EMI-3342-103-65U,
Contract DA-49-186-AMC-67,
Unclassified report

Descriptors: (*Electric fields, Measuring devices (Electrical + Electronic)), (*Measuring devices (Electrical + Electronic), Geophysics), Earth (Planet), Atmosphere, Electrical properties, Measurement

A laboratory model electric field meter has been designed and constructed to determine the feasibility of measuring small variations in the earth's electric field. As a result of the tests performed with this instrument, a larger field meter of similar design but with increased sensitivity has been placed in operation. This meter will detect changes in the earth's electric field of 78 millivolts /meter. A theoretical investigation of the response of the earth's electric field to a distant electrical impulse has been performed. (Author)

**AD-628 380 Fld. 14/2, 13/11**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARO INC TULLAHOMA TENN*
**A TECHNIQUE FOR MEASURING CAPTURE COEFFICIENTS AND APPLICATION TO THE MEASUREMENT OF HYDROGEN ADSORPTION BY TITANIUM.**
Technical rept. for May-Aug 64,
by T. L. Moody. Feb 66, 45p. Contract AF 40 (600)-1200, Proj. ARO-SW3417,
AEDC TR-65-123
Unclassified report

Descriptors: (*Vacuum pumps, Adsorption), (*Hydrogen, Adsorption), (*Titanium, Evaporation), Ionization gages, Deposition, Space simulation chambers

The problems encountered in making capture coefficient measurements are reviewed, and a new experimental technique, employing a rotating gage, is presented. Utilizing this technique, the fraction of impinging hydrogen molecules removed by a continuously deposited titanium surface was determined as a function of the titanium evaporation rate and gas flux. The results demonstrate that there is little to be gained by evaporating more than one atom of titanium for each atom of hydrogen. (Author)

**AD-628 415 Fld. 14/2, 9/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*BUREAU OF NAVAL WEAPONS REPRESENTATIVE POMONA CALIF METROLOGY ENGINEERING CENTER*
**MEASUREMENT OF FREQUENCY DEVIATION,**
by K. H. Klarer. 15 Mar 65, 25p. Rept. no. Engineering Circular-12,
Unclassified report

Descriptors: (*Test equipment (Electronics), Frequency), (*Frequency, Test equipment (Electronics)), Calibration, Frequency modulation, Signal generators, Sweep generators

The information contained in this circular is intended solely for the utilization of the Navy Calibration Program. Frequency deviation, swept symmetrically from a center frequency, is often used in the alignment of frequency modulation receivers. Other uses are the alignment or test of video amplifiers for radar service and wideband amplifiers where the rapid and accurate setting of the bandpass and contour are desired. The purpose of this circular is to discuss several methods which have been used or developed to measure the accuracy of FM generators commonly used to meet the above needs.

**AD-628 428 Fld. 14/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**A SYSTEM FOR AUTOMATIC PRESSURE RECORDING IN SUBLIMATION DRYING,**
by K. P. Rusanova, and V. V. Demyanovsky. 4 Feb 66, 4p. Rept. no. I-9054-F
TT 66-60607

Unclassified report

Sistema Avtomaticheskoi Zapisi Davlenii pri Sublimatsionnoi Sushke Produktov, trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Pishchevaya Tekhnologiya (USSR) n1 p167-71 1964.

Descriptors: (*Pressure gages, USSR), Automatic, Manometers, Vacuum apparatus, Sublimation, Driers (Apparatus)

The method is based on the principle of the action of a Manometer with Bourdon tubes. A Bourdon tube with its stem hermitically welded, is placed in a sublimation chamber on an elastic string. On the flat portion of the manometric coil in the 'active filament' region, two tensometer pickups are cemented on each side, which are connected to an electronic bridge. In pumping air from the chamber, the coil, filled with dry air at atmospheric pressure, undergoes general expansion which is recorded by an autoscriber.

**AD-628 570 Fld. 14/2**
**CFSTI Prices: HC $4.60 MF $0.50**
*MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB*
**METHODS OF CONTROLLING THE ROLL DEGREE OF FREEDOM IN A WIND TUNNEL MAGNETIC BALANCE. PART I. PRODUCTION OF ROLLING MOMENTS.**
Interim scientific rept., Jan 64-Mar 65,
by Timothy Stephens. Dec 65, 47p. Contract AF 33 (615)-1470, Proj. AF-7065,
ARL 65-242

Unclassified report

Descriptors: (*Suspension devices, Wind tunnel models), (*Wind tunnel models, Suspension devices), (*Magnetic fields, Suspension devices), Ferromagnetic materials, Models (Simulations), Roll, Control systems

This report presents a discussion of methods of producing rolling moments by magnetic fields on a model suspended in a magnetic wind tunnel balance system. Two methods are described and compared: one involving the interaction of steady nonuniform fields with a nonuniformly magnetized body, and the other involving the interaction of an alternating uniform magnetic field with a closed loop of conducting material. The two alternative methods are translated into magnet configurations designed to satisfy the objective of a completely integrated six degree of freedom balance system. (Author)

**AD-628 614 Fld. 14/2, 13/1**
**CFSTI Prices: HC $6.60 MF $0.75**
*AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO*
**DEVELOPMENT AND OPERATION OF AN ELECTRICAL-RESISTANCE AIR HEATER FOR THE ARL TWENTY-INCH HYPERSONIC WIND TUNNEL.**
Internal scientific rept.,
by Richard T. Goddard, and David H. Murray. Nov 65, 63p. Rept. no. ARL-65-226, Proj. AF-7065,

Unclassified report

Descriptors: (*Hypersonic wind tunnels, Heaters), (*Heaters, Hypersonic wind tunnels), Resistance (Electrical), Heating elements, Aerodynamics, Test facilities, Electrical equipment

An electrical resistance heater has been designed and fabricated to preheat the air in the 20-inch hypersonic wind tunnel of the Fluid Dynamics Facilities Laboratory located at Wright-Patterson Air Force Base. The heater was designed to heat air to 2800R at mass flow ranges of one-half pound per second to ten pounds per second. Stagnation pressure can be varied between 600 psi to 2500 psi. The report traces the development of the present heater and includes a heat transfer analysis required to design this type of heater. In addition, a comparison is made between experimental and theoretical results. The heater described in the report has been successfully operated for several hundred hours during a three year period. The report presents recommendations that might be made to improve this highly essential component. (Author)

**AD-628 782 Fld. 14/2, 8/10**
**CFSTI Prices: HC $6.60 MF $0.75**
*NEW YORK UNIV N Y GEOPHYSICAL SCIENCES LAB*
**A SHALLOW WATER ISOBARIC BUOY.**
Technical rept.,
by Cyrus Adler. Jan 66, 64p. Rept. no. TR-66-2,
Contract Nonr-285 (57),

Unclassified report

Descriptors: (*Ocean currents, Measurement), (*Seacoast, Ocean currents), (*Buoys, Oceanographic equipment), Test methods, Tests, Hydrophones, Underwater tracking, Tides, Bays, Estuaries

The genesis, development, and testing of an instrument for following currents in shallow waters is described. The volume of the 'shallow water isobaric buoy' (SWIB) varies in response to pressure signals derived from the depth of the water in which the instrument floats. Mechanisms for autovariation of density and automatic hovering systems are discussed. Descriptions are presented of the gas-powered volume-changing mechanism, the pingerhydrophone tracking arrangement and various retrieval techniques. Bench, pool, and field tests in Long Island Sound of the initial models of the SWIB indicate the feasibility of the system. The instrument can hover in a relatively restricted horizontal layer. The instrument may find application as a water stability indicator as well as a shallow water current tag. (Author)

**AD-628 050 See Fld. 13/13**

**AD-628 193 See Fld. 13/10**

**AD-628 194 See Fld. 11/3**

**AD-628 215 See Fld. 4/1**

**AD-628 268 See Fld. 20/9**

**AD-628 274 See Fld. 12/1**

**AD-628 286 See Fld. 13/2**

**AD-628 290 See Fld. 13/2**

**AD-628 440 See Fld. 13/10**

**AD-628 506 See Fld. 10/2**

**AD-628 538 See Fld. 11/6**

**AD-628 628 See Fld. 20/4**

**AD-628 647 See Fld. 20/6**

**AD-628 693 See Fld. 17/2**

**AD-628 837 See Fld. 13/2**

**AD-628 860 See Fld. 8/7**

**AD-628 865 See Fld. 11/6**

## 14/4. RELIABILITY

**AD-628 100 Fld. 14/4, 15/5, 9/5**
**CFSTI Prices: HC $6.60 MF $0.75**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**ESTABLISHING RELIABILITY REQUIREMENTS FOR MILITARY WEAPON SYSTEMS AND EQUIPMENT.**
Master's thesis,
by Robert L. McCall. Dec 65, 63p. Rept. no. GRE/SM/65-2,

Unclassified report

Descriptors: (*Reliability, Weapon systems), (*Weapon systems, Military requirements, Reliability (Electronics), Economics, Altimeters, Radar equipment

This study was made to investigate the hypothesis that an economic analysis can be used as the basis for establishing reliability requirements. The economic basis for such an analysis is established and the AGREE reliability cost model and the WSEIAC reliability allocation model are reviewed. The problem of determining cost reliability relationships because of the lack of historical data and the problem of representing the value of reliability in an analysis are discussed. Finally, an economic analysis is made of the APN-159 radar altimeter, using historical data. The conclusion is that an economic analysis can be used as the basis for establishing reliability requirements of military weapon systems and equipment. (Author)

**AD-628 102 Fld. 14/4, 14/1, 15/5**
**CFSTI Prices: HC $8.60 MF $0.75**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**AN ANALYSIS OF THE ECONOMIC RISK OF THE EXPONENTIAL ASSUMPTION IN RELIABILITY TESTING.**
Master's thesis,
by Stephen G. Dizek. Dec 65, 82p. Rept. no. GRE/SM/65-01,

Unclassified report

Descriptors: (*Reliability, Statistical tests), (*Economics, Reliability), Probability, Operations research, Decision theory, Mathematical models, Logistics

The characteristics of the exponential time to failure distribution are compared with those of Weibull life distributions with shape parameter greater than one. Computer simulation is used to determine the probability of accepting an exponential life distribution hypothesis when the distributions are Weibull. An economic model is then used to show that, for items meeting reliability specifications, the risk may increase with the shape parameter when the exponential life distribution is assumed and sampling plans based on it are used. Author)

**AD-628 836 Fld. 14/4**
*WASHINGTON UNIV SEATTLE LAB OF STATISTICAL RESEARCH*
**A STOCHASTIC CHARACTERIZATION OF WEAR-OUT FOR COMPONENTS AND SYSTEMS.**
Technical rept.,
by Z. W. Birnbaum, J. D. Esary, and A. W. Marshall. 25 Jan 66, 23p. Rept. no. TR-46,
Contract Nonr-477 (38) Proj. NR-042-038,
Unclassified report

Prepared in cooperation with Boeing Scientific Research Labs., Seattle, Wash., Rept. no. D1-82-0460.

Descriptors: (*Life expectancy, Statistical analysis), (*Reliability, Stochastic processes), Wear resistance, Equations, Probability, Hazards, Failure (Mechanics), Distribution functions

It is well known that the future life distribution of a device remains the same regardless of the time it was previously in use, if and only if the life distribution of that device is exponential. For this reason exponential life distributions are accepted as characterizing the phenomenon of no-wear. The problem of finding a class of life distributions which would similarly reflect the phenomenon of wear-out has been under investigation for some time. In answer to this problem we introduce in this paper the class of IHRA (Increasing Hazard Rate Average) distributions and show that it has, among others, the following optimal properties: (i) it contains the limiting case of no-wear, i.e., all exponential distributions, (ii) whenever components which have IHRA life distributions are put together into a coherent system, this system again has an IHRA life distribution, i.e., a system wears out when its components wear out, and (iii) the IHRA class is the smallest class with properties (i) and (ii). (Author)

**AD-628 336** **See Fld. 12/2**

**AD-628 661** **See Fld. 12/1**

## 14/5. REPROGRAPHY

**AD-628 485 Fld. 14/5, 9/3**
**CFSTI Prices: HC $1.00 MF $0.50**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J*
**PINHOLE ARRAY CAMERA FOR INTEGRATED CIRCUITS,**
Technical rept.,
by Phillip A. Newman, and Vincent E. Rible. Jan 66, 19p. Rept. no. ECOM-2653,
Proj. DA-1P622001A056, Task 1P622001A056-02,
Unclassified report

Descriptors: (*Intergrated circuits, Cameras), (*Special purpose cameras, Intergrated circuits), Design, Theory, Manufacturing method, Microminiaturization (Electronics), Microphotography

A pinhole camera for the production of multiple images for integrated circuits, consisting of an array of precisely positioned uniform diameter pinholes and a vacuum back to hold the film or plate, has been designed, fabricated, and tested. This camera was designed to replace the step-and-repeat camera method of producing multiple images that is presently used. The two basic requirements for repetition of circuit patterns are the achievement of high image quality and precise registration between all the masks in a set. The arrangement discussed here permits lines of .0005" width in the final working mask with precise registration. (Author)

**AD-628 601 Fld. 14/5, 6/18**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J INST FOR EXPLORATORY RESEARCH*
**ARRESTING LATENT-IMAGE FADING IN DOSIMETRIC FILMS.**
Revised ed.,
by Basil Markow. 7 Sep 65, 2p.
Unclassified report

Revision of manuscript submitted 4 Jan 65.

*Availability: Published in Photographic Science and Engineering v9 n6 p353-4 Nov-Dec 1965. Copies to DDC users only.*

Descriptors: (*Dosimeters, Radiographic film), (*Photographic images, Radiographic film), Attenuation, Countermeasures

The problem of latent-image fading in dosimetric film is usually avoided by exposing a set of calibration films to a known source of gamma or x-radiation simultaneously with the exposure of experimental films to an unknown source. Both the experimental and calibration films are then developed together avoiding any difference in fading. This procedure breaks down if the unknown radiation intensity is very high while the calibration source intensity is very low, requiring comparatively long calibration exposures. Experiments were conducted in an effort to eliminate the above latent-image fading problem.

**AD-628 080** **See Fld. 8/7**

**AD-628 568** **See Fld. 20/4**

**AD-628 588** **See Fld. 17/8**

# Field 15-MILITARY SCIENCES

## 15/2. CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE

**AD-628 146 Fld. 15/2, 5/5**
**CFSTI Prices: HC $1.60 MF $0.50**
*HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA*
**THE EFFECTS OF PROTECTIVE MASKING UPON SMOKE GENERATOR AND FUEL SUPPLY TEAM PERFORMANCE (AN ANALYSIS OF AN EXPERIMENT CONDUCTED BY THE U. S. ARMY CHEMICAL CORPS).**
Research memo.,
by Richard I. Moren, and William E. Montague. Apr 59, 16p.
Unclassified report

Descriptors: (*Protective masks, Human engineering), (*Performance (Human), Army personnel), Chemical warfare, Biological warfare, Radiological warfare, Smoke generators, Fuels

The following conclusions apply to the daylight performance, under cool pleasant weather conditions, of teams thoroughly practiced in their jobs and experienced in wearing the mask: (1) On the average, the decrement in job performance caused by wearing the protective mask is about 5 per cent for smoke generator and fuel supply teams, though specific performances fluctuate widely about this value. (2) When the protective mask is worn for four hours on each of three consecutive working days, there is no evidence to indicate that performance decrement either increases or decreases systematically. Nor is there evidence for any systematic change in the decrement as a result of a subsequent bivouac experience involving 68 hours of masking. (Author)

**AD-628 173 Fld. 15/2**
**CFSTI Prices: HC $2.00 MF $0.50**
*WESTINGHOUSE RESEARCH LABS PITTSBURGH PA*
**DEVELOPMENT OF A MULTIPURPOSE KIT. FIFTH REPORT PHASE III.**
Rept. no. 12, 1 Sep-30 Nov 65,
by F. P. Byrne, F. R. Agnew, A. C. Beare, O. H. Kriegeand , and R. J. McKeever. 30 Nov 65, 28p.
Contract DA-18-108-AMC-115 (A),
Unclassified report

See also AD-425 927.

Descriptors: (*Chemical warfare agents, Detectors), (*Chemical indicators, Chemical warfare agents), Manufactoring methods, Colors, Sensitivity, Vapors, Nerve agents, Phosgene, Cyanogen, Water, Samplers, Mustard agents, Lewsite, Cyanides, Containers, Materials

Two types of kit evaluation were carried out. One was the evaluation of the product coming off the pilot line; the second was an evaluation of the foot soldier's ability to recognize the positive sampler test. The vapor samplers yield results meeting sensitivity requirements for nerve agent, phosgene, phosgene oxime and cyanogen chloride. There are problems associated with hydrogen cyanide, Lewisite and mustard. For the water sampler, the mustard, Lewisite, cyanide and cyanogen chloride, sensitivity requirements were met. The color recognition study suggests that by proper color description or by the use of a properly designed, color bar a high degree of recogntion may be achieved. Development of the case is essentially complete. Methods for hinge forming and for strap attachment are completed. Work remains to be done on the unknown sample tube. The search for a plastic substitute for Kel-F continues. Two candidate materials have emerged. One is a Teflon, the other a polyvinyl fluoride. Further testing is in progress and investigation of thesealing and laminating properties of these two substitutes is in progress. (Author)

**AD-628 553** **See Fld. 6/13**

**AD-628 584** **See Fld. 6/1**

## 15/3. DEFENSE

**AD-628 726** **See Fld. 15/6**

## 15/4. INTELLIGENCE

**AD-628 495 Fld. 15/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*HRB-SINGER INC STATE COLLEGE PA*
**A CONCEPT FOR MODELING AND EVALUATING INFORMATION-PRODUCING SYSTEMS,**
by Gene A. Markel. 28 Jan 66, 41p. Rept. no. HRBI-352.13-R-1,
Contract Nonr-3818 (00),
Unclassified report

See also AD-619 373.

Descriptors: (*Military intelligence, Systems engineering), Mathematical models, Navy, Computers, Simulation

A concept for modeling multisensor intelligence systems is described, and a related set of procedures is presented for analyzing and evaluating the performance of such systems. The methodology provides for replication of system performance by using computer simulation models for various kinds of sensors, combining the inputs introduced into the system by the specified sensor mix, and transforming the combined inputs into an integrated output for the system as a whole. Particular attention is given to the method used for combining multisensor collection system performance data into a representation of overall intelligence output capability. Special emphasis also is placed upon the subsequent use of the data in this output representation for evaluative purposes. The concept is presented both in the specific context of an



211-792 O-66-6

order-of-battle intelligence system and in a more generalized frame of reference. (Author)

## 15/5. LOGISTICS

**AD-628 057 Fld. 15/5, 21/5**
**CFSTI Prices: HC $3.00 MF $0.75**
*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING*
**TURBOJET ENGINE PROCUREMENT COST ESTIMATING RELATIONSHIPS.**
Research paper (Master's thesis),
by Robert Patterson Gould. Aug 65, 83p. Rept. no. GSM/SM/65-10,
Unclassified report

Descriptors: (*Air force procurement, Turbojet engines), (*Turbojet engines, Costs), Procurement, Performance (Engineering), Mathematical models

Cost estimation is a critical phase of national defense planning, programming, and budgeting. The historical means of accomplishing this in the Air Force is largely qualitative and subjective. Quantitative cost estimation techniques and some major pitfalls in usage are explored. Despite many assumptions and approximations, cost estimating relationships are felt to offer a sound basis for cost estimation in practice. Turbojet engine costs and major characteristics are determined for fourteen engines, and an effort is made to reveal a basic cost-cahracteristic relationship. A linear or log-linear relationship is hypothesized. Although theoretical parameters of engine description appear promising, multiple regression of them singly and in combination fail to substantiate cost dependence. A single characteristic, specific weight (dry weight divided by military thrust), accounts for 85% to 92% of cost per unit weight in a log-linear relationship, after four questionable data points are eliminated.

**AD-628 839 Fld. 15/5, 13/10, 13/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*DEPARTMENT OF THE ARMY WASHINGTON D C*
**THE DOCKERS OF ARKHANGELSK,**
by M. F. Prichert, and B. A. Khudovekov. 3 Jan 66, 33p. Rept. no. LN-268-65,
TT 66-60642
Unclassified report

Trans. of mono. Portoviki Arkhangelska, Moscow, p3,4, 7,14,15,16,26,27,28,29,3 0,31-7,38-40,56,57,59-61,69-71.

Descriptors: (*Harbors, Handling), (*Handling, Shipping (Marine)), (*Shipping (Marine), Handling), Logistics, Machines, Conveyors, Hoists, Industrial equipment, Cargo vehicles, Vehicles, Transporter-erectors, USSR, Wood pulp, Wood, Coal, Cement

**AD-628 099 See Fld. 14/1**

**AD-628 100 See Fld. 14/4**

**AD-628 101 See Fld. 5/1**

**AD-628 102 See Fld. 14/4**

## 15/6. NUCLEAR WARFARE

**AD-628 726 Fld. 15/6, 15/3**
**CFSTI Prices: HC $1.10 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**RED STAR SERIES ON ATOMIC WEAPONS AND ANTIATOMIC DEFENSE. PART V. ENGINEERING PREPARATION OF THE TERRAIN,**
by F. J. Krieger. 26 Aug 54, 10p. Rept. no. T-41,
Unclassified report

Trans. from Krasnaya Zvezda, 26 Aug p2 1954.

Descriptors: (*Military engineering, Nuclear warfare), (*Nuclear warfare, Fortifications), (*Fortifications, Nuclear warfare), Military USSR

The article is concerned with the problems of digging in and preparing earthen shelters for both men and materiel in case of atomic attack.

**AD-628 506 See Fld. 10/2**

## 15/7. OPERATIONS, STRATEGY, AND TACTICS

**AD-628 667 Fld. 15/7**
**CFSTI Prices: HC $12.60 MF $0.75**
*HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA*
**DEVELOPMENT OF IMPROVED RIFLE SQUAD TACTICAL AND PATROLLING PROGRAMS FOR THE LIGHT WEAPONS INFANTRYMAN.**
Technical rept.,
by Joseph S. Ward, and N. I. Fooks. Dec 65, 121p. Rept. no. TR-65-16,
Contract DA-44-188-ARO-2, Proj. DA-2J024701A712-01,
Unclassified report

Descriptors: (*Military training, Tactical warfare), (*Tactical warfare, Army training), (*Army training, Tactical warfare), Army personnel, Warfare, Training

This report, on the final subtask of Task RIFLEMAN, presents and evaluates the improved Rifle Squad Tactical and Patrolling training programs developed to increase the combat proficiency of the Light Weapons Infantryman in Advanced Individual Training (MOS 111.0). The specific objective was to enable the trainee (1) to integrate previously learned skills and knowledges into effective combat behaviors, (2) to coordinate their use with those of fellow squad members, and (3) to execute tactical actions on orders of squad leaders. The method of research included (1) observation of current training and interviews with experienced instructors at Army training centers in order to identify LWI performance deficiencies, (2) derivation of training content from official Army literature and RIFLEMAN I LWI job descriptions, and (3) sequencing of training content into learning units consisting of exercises to form a complete combat action, progressing from emphasis on individual skills to integration of those skills in the squad. The resulting experimental program was administered to two companies of AIT trainees at Fort Ord, California, and was rated as more, or much more, effective than existing programs. (Author)

**AD-628 731 Fld. 15/7, 19/6**
**CFSTI Prices: HC $5.60 MF $0.50**
*ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS*
**ARTILLERY WEAPON DUST ALLEVIATION TESTS.**
Final technical rept.,
by J. L. Decell. Feb 66, 51p. Rept. no. TR-3-714,
Unclassified report

Descriptors: (*Artillery fire, Dust), (*Dust, Artillery fire), (*Camouflage, Artillery fire), Soils, Stabilization systems, Protective coverings, Firing tests, Ordnance laboratories, Artillery

Tests were conducted at the Rock Island Arsenal and the Yuma Proving Ground to determine the effectiveness of medium-weight and lightweight ground covers when used as dust alleviators beneath the muzzle blast of an XM-102 artillery weapon. The ground covers proved to be adequate dust alleviators, and test results indicate that a minimum size cover of 75 by 75 ft should be used with the XM-102 weapon. The lightweight ground covers tested indicate a definite need for reinforcement in the area where the weapon itself is secured to the ground. None of the ground covers were damaged by muzzle blasts. (Author)

**AD-628 764 Fld. 15/7**
**CFSTI Prices: HC $1.00 MF $0.50**
*FRANKFORD ARSENAL PHILADELPHIA PA SMALL CALIBER ENGINEERING DIRECTORATE*
**AN ELECTRONIC TRIGGERING DEVICE FOR BOOBY TRAP AND PERIMETER DEFENSE APPLICATIONS.**
Memorandum rept.,
by William A. Dittrich. Nov 65, 12p. Proj. DA-1W542703D346,
FA M66-14-1
Unclassified report

Descriptors: (*Warning systems, Demolitions), Trigger circuits, Mines (Ordnance), Design, Production, Tests

A simple, inexpensive electronic trigger device has been designed, fabricated, and tested for use in demolition, booby trap, and perimeter defense applications. The interruption of a minute current caused when a fine trip wire is broken is used to switch an electric current to a detonator, claymore mine, alarm or similar device. Tests conducted to date show its feasibility. Recommendations for additional work include final selection of operation current and voltage as determined by user requirements, and tests to assure conformance with environmental specifications. (Author)

**AD-628 749 See Fld. 9/2**

# Field 16-MISSILE TECHNOLOGY

## 16/2. MISSILE TRAJECTORIES

**AD-628 784 See Fld. 17/8**

## 16/4. MISSILES

**AD-628 078 See Fld. 22/2**

## 16/4.2 SURFACE-LAUNCHED MISSILES

**AD-628 151 Fld. 16/4.2**
**CFSTI Prices: HC $3.00 MF $0.75**
*BOEING CO SEATTLE WASH*
**ACCEPTANCE SUMMARY REPORT - FTM 460.**
by R. E. Wade. Jan 66, 62p. Rept. no. D2-3929-460,
Contract AF 04 (694)-266,
Unclassified report

Descriptors: (*Guided missiles (Surface-to-surface), Acceptability), Military requirements, Guided missile components, Strategic weapons

The purpose of D2-3929 is to document an Acceptance Summary Report for Flight Test Missiles as required to support final acceptance activities at the Boeing Atlantic Test Center (BATC). It provides evidence of missile configuration identification and certification. It defines deviations from compliance with the Airborne Vehicle Model Specification, S-133-1011. Reference Document D2-6272, Missile Functional Test Procedures, for a record of testing performed and for a record of specified acceptance test measurements.

# Field 17-NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

## 17/1. ACOUSTIC DETECTION

**AD-628 055 Fld. 17/1, 6/4**
**CFSTI Prices: HC $4.00 MF $0.75**
*SENSORY SYSTEMS LAB TUCSON ARIZ*
**EXPERIMENTAL STUDIES ON TARGET DETECTION, EVALUATION AND INTERCEPTION BY ECHOLOCATING BATS.**
Final rept. May 64-Feb 65,
by Frederic A. Webster, and Oliver G. Brazier.
Nov 65, 144p. Contract AF 33 (615)-1142,
Proj. AF-7233, Task 723302,
AMRL TR-65-172

Unclassified report

Descriptors: (*Bats, Echo ranging), (*Bionics, Echo ranging), (*Echo ranging, Bionics), (*Target recognition, Bionics), Sound ranging, Background, Noise, Auditory perception

The echolocation techniques of bats provide functioning models with useful attributes: versatility of application, ultra-miniaturization of components, and processing methods capable of dealing rapidly and reliably with complex echo indications despite the inherent slowness of unit neural components. Present experiments, carried out on captive bats trained to catch natural and artificial targets projected into their flight paths, have quantified certain basic measures of performance. Spheres as small as 1/16 inch diameter were detected and localized at two or more feet, with resulting interceptions being accomplished in 1/4 second. Final localization accuracies of 1 cubic centimeter were sometimes achieved, even when resolution of up to 16 nearby targets was required. Massive or complex clutter backgrounds tended to reduce interception performance at short target-to-clutter distances, but some interceptions were accurately completed during actual contact with natural twigs or goliage; or when pursuit paths had to be radically adapted to background configurations. Interception scores for food targets sometimes exceeded 99% while like-size negative targets of a different shape could be correctly discriminated roughly 95% of the time. (Author)

**AD-628 326 Fld. 17/1, 20/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*TRACOR INC AUSTIN TEX*
**PARAMETRIC ANALYSIS OF DOME-TRANSDUCER INTERACTIONS.**
Technical memo.,
by W. C. Moyer, and J. D. Morell. 10 Feb 66,
66p. Rept. no. tracor-66-136-U,
Contract NObsr-91229, Proj. SF101-03-17,
Task 8139,

Unclassified report

Descriptors: (*Sonar domes, Sound transmission), (*Sound transmission, Sonar domes), (*Transducers, Sonar domes), Compatibility, Experimental design, Mathematical models

This memorandum presents some results of a parametric analysis of the interaction of sonar domes and transducers during transmission. The results were obtained from the numerical evaluation of an analytical model consisting of a cylindrical transducer and concentric dome. The dome-transducer parameters considered in this study include dometransducer spacing, transducer diameter, transmitting frequency, dome thickness, and material properties of the dome. The parameter ranges include values appropriate to the AN/SQS-4, AN/SQS-23, and AN/SQS-26 systems. The results are presented as functions of the dimensionless products of the dome-transducer parameters. In this form, the results represent an initial effort at formulating guidelines which have broad application in dome design. The results show that the dome produces a degradation of each of the performance criteria compared to a bare transducer. The effects of the dome can be reduced, however, by proper choice of dome parameters. It is shown that the product of dome material density and thickness (surface density) is the most important parameter in determining the effect of the dome on transducer performance. (Author)

**AD-628 781 Fld. 17/1, 17/6, 17/8**
**CFSTI Prices: HC $2.60 MF $0.50**
*HUDSON LABS COLUMBIA UNIV DOBBS FERRY N Y*
**THE SEARCH UNDERWATER FOR A DOWNED NAVY JET AIRCRAFT.**
Technical rept.,
by J. Brakl, J. Shaffer, and G. H. Fisher. 6 Dec 65, 28p. Rept. no. CU-146-65-ONR-266-Phys,TR-122
Contract Nonr-266 (84)

Unclassified report

Descriptors: (*Aviation accidents, Underwater object locators), (*Underwater object locators, Effectiveness), Sonar, Television communication systems, Underwater communication systems, Magnetometers, Maps

A search was undertaken during May 1965 for a U. S. Navy jet aircraft that went down in the Buzzards Bay area on April 29, 1965. The operational procedure of the search, as well as the capabilities of the three instruments that were used in it -- sidelooder, magnetometer, underwater TV -- are described. Several anomalous situations are shown and discussed, and recommendations are made for future searches of a similar nature. (Author)

## 17/2. COMMUNICATIONS

**AD-628 693 Fld. 17/2, 9/5, 14/2**
**CFSTI Prices: HC $14.60 MF $1.00**
*SYSTEMS RESEARCH LABS INC DAYTON OHIO*
**TEST AND EVALUATION OF ELECTRONIC IMAGE GENERATION AND PROJECTION DEVICES. VOLUME II. EVALUATION OF TELEVISION SYSTEMS.**
Final rept. Jul 64-Jul 65,
by John H. Harshbarger, and James D. Basinger.
Nov 65, 151p. Contract AF 33 (615)-1889,
Proj. AF 6114, Task 611405,
AMRL TR-65-116-Vol-2

Unclassified report

See also AD-623 908.

Descriptors: (*Television display systems, Flight simulators), (*Training devices, Astronautics), (*Astronautics, Flight simulators), (*Cathode ray tubes, Television display systems), Cathode ray tube screens, Television equipment, Performance (Engineering), Experimental data

This report presents data from an evaluation of the 7WP4 Projection Cathode Ray Tube (CRT) operated in the high resolution mode of 1029-line scanning configuration to produce a suitable display for astronautical simulation training. The capabilities of the CRT were first predicted by theoretical analysis conducted while the tube was in actual operation, then the actual display was analyzed to confirm the theoretical predictions. The test image projected on a screen was viewed by an observer television camera to reduce the displayed image to electronic waveforms which formed the basis for an accurate evaluation. The results obtained during the practical evaluation of the CRT in all ways confirmed the theoretical prediction with a high level of brightness, and adequate grey scale linearity. Spot size was found to vary inversely with the scanning speed; line width is reduced at the faster scanning rates. Resolving capability, limited by spot size, is shown related to both brightness and scanning. (Author)

**AD-628 222** **See Fld. 20/14**

## 17/2.1 RADIO COMMUNICATIONS

**AD-628 227 Fld. 17/2.1, 20/14**
**CFSTI PricesMF $0.75**
*PACIFIC GEEIA REGION SAN FRANCISCO CALIF EMC AND MEASUREMENTS BRANCH*
**ELECTROMAGNETIC ENVIRONMENTAL SURVEY, KUNSAN AB, KOREA, 5 OCTOBER 1965 - 24 OCTOBER 1965.**
21 Jan 66, 31p. Rept. no. PGR-EMC-66-02,

Unclassified report

Descriptors: (*Radiofrequency interference, Korea), (*Radio reception, Korea), Radio signals, Atmospherics, Signal-to-noise ratio, Radio waves, Extremely low frequency, Superhigh frequency, Graphics

As part of a major program to provide electromagnetic environmental information on bases in the Pacific, a survey was conducted at Kunsan AB, Korea, from 5 October through 23 October 1965. All significant signals and noise from 30 cps to 10 gc were recorded. The results of the environmental survey have been prepared in graphic form and other information attached to this report for use by appropriate agencies in planning of communications-electronics facilities. (Author)

**AD-628 672 Fld. 17/2.1**
**CFSTI Prices: HC $1.60 MF $0.50**
*ELECTRO-VOICE INC BUCHANAN MICH*
**LIGHTWEIGHT AUDIO ACCESSORIES.**
Quarterly rept. no. 1, 30 Jun-30 Sep 65,
by B. T. Cochran. Jan 66, 13p. Contract DA-28-043-AMC-01542 (E), Proj. DA 5642.12.922.01,
ECOM 01542-1

Unclassified report

Descriptors: (*Communication equipment, Portable), Microphones, Earphones, Telegraph equipment, Configuration, Reduction, Weight

The report contains a summary of the work performed for the design and construction of a lightweight and miniature type handset, hand-held microphone, double earphone headset and telegraph key. The report contains a review of the work performed in this period which consisted of designing an acceptable configuration of these items and a satisfactory and acceptable electroacoustical design of the earphone and microphone elements. From the preliminary design, configuration, it appears that the design goal of reducing the weight of each item by 50 percent will be readily achieved. Also, these configurations will conform to good human engineering design standards. (Author)

**AD-628 117** **See Fld. 9/5**

**AD-628 871** **See Fld. 20/14**

## 17/6. MAGNETIC DETECTION

**AD-628 781** **See Fld. 17/1**

## 17/7. NAVIGATION AND GUIDANCE

**AD-628 504 Fld. 17/7**
**CFSTI Prices: HC $29.70 MF $1.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**DYNAMIC BALANCING OF ROTORS OF GYROSCOPIC SYSTEMS,**
by M. P. Kovalev, S. P. Morzhakov, and K. S.Terekhova. 9 Nov 65, 301p. Rept. no. FTD-MT-64-36,
TT 66-60621

Unclassified report

Edited machine trans. of mono. Dinamicheskoe Uravnoveshivanie Rotonov Giroskopicheskikh Sistem, Moscow, 1962, 258p.

Descriptors: (*Gyroscopes, Stabilization), Vibration, Dynamics, Gyro stabilizers, USSR, Ball bearings

Principles are expounded of the theory and techniques of dynamic balancing of rotors of miniature gyrometors. There is description of latest balancing equipment, there is offered methodology for tuning balancing machines, and there is also given basic information on structure and techniques of assembling model supports of gyroscopic instruments and devices. It considers reasons for vibrations arising in gyro-instruments are considered. Book is intended for designers and technicians of instrument-making industry, engineering and technical workers occupied in design and operation of balancing instrumentation, and also may be used by students of instrument-making faculties of higher technical and middle specialized institutions. (Author)

**AD-628 558** **See Fld. 5/8**

## 17/8. OPTICAL DETECTION

**AD-628 466 Fld. 17/8, 22/3**
*SMITHSONIAN ASTROPHYSICAL OBSERVATORY CAMBRIDGE MASS*
**THE SMITHSONIAN'S SATELLITE-TRACKING PROGRAM: ITS HISTORY AND ORGANIZATION, PART 3,**
by E. Nelson Hayes. 1965, 37p. Rept. no. Pub-4620,

Unclassified report

*Availability: Published in Smithsonian Report for 1964 p315-50 Smithsonian Institution, Washington, 1965. Copies to DDC users only.*

Descriptors: (*Satellite tracking systems, Optical tracking), Astronomical observatories, Satellites (Artificial), Astronomical data

**AD-628 588 Fld. 17/8, 20/5, 14/5**
**CFSTI Prices: HC $3.00 MF $0.75**
*CBS LABS STAMFORD CONN*
**OPTICAL SPOT SIZE STUDY FOR DATA EXTRACTION FROM A TRANSPARENCY.**
Final rept., Feb-Jul 65,
by L. L. Izzo, and H. A. Cubberly. Sep 65, 80p. Contract AF 33 (615)-2355, Proj. AF-6114, Task 611410,
AMRL TR-65-175

Unclassified report

Descriptors: (*Optical scanning, Lasers), (*Lasers, Optical scanning), (*Photointerpretation, Optical scanning), Optical equipment components, Military intelligence, Photographic images, Optical analysis

A breadboard model scanner using coherent light to generate a small optical spot for data extraction from a transparency was constructed. Using the technique developed, a capability of distinguishing 256 lp/mm and 30 shades of grey from light to dark was demonstrated. The system consists of a laser light source, a beam expander, a beam normalizer, a rotating optical scanning system to cover a 2 inch wide transparency, a transparency holder, a light collector and a photomultiplier assembly including video amplifier and high voltage power supply. These system components are basically 'off-the-shelf' items. (Author)

**AD-628 784 Fld. 17/8, 16/2**
**CFSTI Prices: HC $3.60 MF $0.50**
*BLOCK ENGINEERING INC CAMBRIDGE MASS*
**WAVEFRONT FOLDING INTERFEROMETER.**
Final rept. 1 Sep 63-28 Feb 65,
by Robert L. Whalen. 25 Jan 66, 32p. Contract AF 19 (628)-3314,ARPA Order-450 Proj. AF-8663,
AFCRL 66-94

Unclassified report

Descriptors: (*Atmosphere entry, Optical tracking), (*Inerferometers, Atmosphere entry), Reentry vehicles, Guided missiles, Tracking, Design, Optical equipment, Optical instruments, Theory, Guided missile ranges, Guided missile trajectories

Results of a design study of a wavefront folding interferometer were applied to the fabrication of a prototype interferometer which was experimentally employed to make angular diameter measurements of missile re-entries. The interferometer, based on a modification to Lloyd's mirror, displays the space frequency Fourier transform, including both amplitude and phase, of an incoherently illuminated object. Because the wavefront folding interferometer provides a direct positional reference, this instrument was used in the field to provide a measure of both apparent angular diameter and tracking error. The field instrument consists of a 14 cm collector telescope, a wavefront folding interferometer, and an 8 mm camera to record the fringe pattern. During the experimental program carried out on the Pacific Missile Range, the interferometer was installed on a Roti optical tracking mount. Because of the extreme pointing sensitivity of the instrument and the relatively crude tracking provided, difficulties were encountered which would be absent with more accurate tracking. Use of the folding interferometer to measure the apparent diameter of a time varying source such as a reentry body is deemed a promising technique worthy of further investigation. (Author)

**AD-628 781** **See Fld. 17/1**

## 17/9. RADAR DETECTION

**AD-628 554 Fld. 17/9, 12/2**
**CFSTI Prices: HC $4.00 MF $1.00**
*RAND CORP SANTA MONICA CALIF*
**EVALUATION OF THE DETERMINANTAL POLYNOMIAL OF A MATRIX OF POLYNOMIAL ELEMENTS AND AN APPLICATION TO AMTI RADAR**
by M. I. Liechenstein. Jan 66, 129p. Rept. no. RM-4837-PR,
Contract AF 49 (638)-1700,

Unclassified report

Descriptors: (*Polynomials, Matrix algebra), (*Determinants, Polynomials), (*Radar signals, Synthesis), Airborne, Moving target indicators, Detection, Algorithms

The requirement to expand the determinant of a matrix whose elements are polynomials of a common variable is encountered frequently in system analyses and optimizations. Inasmuch as this generalized eigenvalue problem is pertinent in studies of system behavior and synthesis for a broad class of systems, it is desirable to secure a computational technique, amenable to both manual and machine execution, which enables efficient calculation of the coefficients of a determinantal polynomial. To this end, an algorithm is derived, computer programs detailed, and tables provided in this Memorandum which accomplish the polynomial evaluation predominantly by reference to established tables. The particular application which motivated the computationaltechnique detailed in this memorandum arose from renewed inquiry into problems of airborne radar signal synthesis. The need to evaluate the determinantal polynomial and roots of matrices is found in the design equations for processors of signals in airborne moving target indicator (AMTI) pulse doppler radars. The relevance of the algorithm to the construction of AMTI systems with characteristics enhancing detection of objects over land is clarified in this memorandum through the discussion of a generalized delay-line canceler signal processing scheme. (Author)

**AD-628 633 Fld. 17/9, 20/3**
*PYLE-NATIONAL CO CHICAGO ILL*
**THE THEORETICAL AND NUMERICAL DETERMINATION OF THE RADAR CROSS SECTION OF A FINITE CONE.**
Physical sciences research papers (Revised ed.), by F. V. Schultz, G. M. Ruckgaber, J. K. Schindler, and C. C. Rogers. 5 Apr 65, 12p. Contract AF 19 (628)-1691, Proj. AF-5635, Task 563502, AFCRL 65-756 ,PSRP-156

Unclassified report

Revision of manuscript submitted 17 Feb 65.

*Availability: Published in Proceedings of the IEEE, v53 n8 p1065-6 Aug 1965. Copies to DDC users only.*

Descriptors: (*Radar echo areas, Conical bodies), (*Conical bodies, Radar echo areas), Electromagnetism, Electromagnetic waves, Backscattering, Theory, Numerical analysis

In this work, rigorous electromagnetic theory is used to determine the nose-on radar cross section of a perfectly conducting cone of finite height. The end cap of the cone is assumed to be a segment of a spherical surface with center at the apex of the cone. Numerical results have been obtained for a cone having a total apex angle of 30 degrees and for values of ka ranging from 0.0259 to 5. 18, where k = 2 pi/lambda and a is the radius of the base of the cone. These data are compared with theoretical results obtained by using Siegel's rayleigh method and by using Keller's modified geometrical optics, as well as with experimental results obtained by Keys. The comparisons are instructive below ka=3.2, the apparent upper limit of validity of the present results. (Author)

**AD-628 200** **See Fld. 20/14**

**AD-628 494** **See Fld. 5/8**

**AD-628 616** **See Fld. 20/14**

**AD-628 819** **See Fld. 9/2**

## 17/10. SEISMIC DETECTION

**AD-628 148** **See Fld. 8/11**

**AD-628 860** **See Fld. 8/7**

# Field 18-NUCLEAR SCIENCE AND TECHNOLOGY

## 18/3. NUCLEAR EXPLOSIONS

**AD-628 783** **See Fld. 13/12**

## 18/4. NUCLEAR INSTRUMENTATION

**AD-628 761** **See Fld. 3/2**

## 18/8. RADIOACTIVITY

**AD-628 691** **See Fld. 9/1**

**AD-628 730** **See Fld. 4/2**

**AD-628 879** **See Fld. 20/8**

**AD-628 880** **See Fld. 20/8**

**AD-628 881** **See Fld. 20/8**

**AD-628 882** **See Fld. 20/8**

# Field 19-ORDNANCE

## 19/1. AMMUNITION, EXPLOSIVES, AND PYROTECHNICS

**AD-628 219 See Fld. 12/2**

## 19/4. EXPLOSIONS, BALLISTICS, AND ARMOR

**AD-628 289 See Fld. 13/13**

## 19/6. GUNS

**AD-628 731 See Fld. 15/7**

## 19/8. UNDERWATER ORDNANCE

**AD-628 505 Fld. 19/8**
**CFSTI Prices: HC $2.00 MF $0.50**
*NAVAL AIRCRAFT TORPEDO UNIT QUONSET POINT R I*
**TORPEDO STABILIZER MARK 31 MOD O DEVELOPMENT PHASE.**
Final rept.,
by A. R. Ferrier. Jan 66, 37p. Rept. no. NAVAIRTORPU-TM-189,
Unclassified report

Descriptors: (*Aircraft torpedoes, Stabilization systems), Helicopters, Torpedo launchers, Torpedo trajectories, Drag parachutes, Torpedoes

This final report describes the development of the parachute-type Torpedo Stabilizer Mark 31 Mod O currently used as a Torpedo Mark 46 helicopter launching accessory. The stabilizer incorporates a novel release mechanism which has proven to be a highly reliable principle of operation. Calculated and experimental data is presented to validate the design concept and to provide a basis for an improved model development program. Recommendations are made for its use with Torpedoes Mark 44 and 46 Mod 1 at extended launching conditions. (Author)

# Field 20-PHYSICS

## 20/1. ACOUSTICS

**AD-628 127 Fld. 20/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*PARKE MATHEMATICAL LABS INC CARLISLE MASS*
**FURTHER RESULTS ON ACOUSTIC RADIATION FROM A FINITE CYLINDER.**
Scientific rept.,
by Charles H. Sherman, and Dorothy A. Moran. Jan 66, 57p. Rept. no. Scientific-3,
Contract N140 (70024)75686B
Unclassified report

See also AD-601 418.

Descriptors: (*Transducers, Acoustic properties), Cylindrical bodies, Potential theory, Wave functions, Special functions (Mathematical)

The earlier work on acoustic radiation from a cylinder was extended by working out the low frequency approximation and doing more machine calculations. A variety of boundary conditions and cylinder height to diameter ratios were treated in the low frequency approximation, and the results were used to study the limitations of the method of calculation. The machine calculations were performed for cases in which the method should yield reliable far field results. Several different cases of cylinders vibrating symmetrically on the ends with uniform and parabolic velocity distributions were treated. Directivity patterns and radiation resistances were obtained which should be useful in transducer design work. (Author)

**AD-628 304 Fld. 20/1, 8/10**
*PACIFIC NAVAL LAB ESQUIMALT (BRITISH COLUMBIA)*
**AMBIENT NOISE UNDER ARCTIC-SEA ICE,**
by A. R. Milne, and J. H. Ganton. 22 Jan 64, 10p. Rept. no. Reprint-64-5,
Unclassified report

*Availability: Published in The Journal of the Acoustical Society of America v36 n5 p855-63 May 1964. Copies to DDC users only.*

Descriptors: (*Underwater sound, Arctic Ocean), (*Arctic Ocean, Underwater sound), (*Noise, Arctic Ocean), Ice islands, Underwater, Acoustics

Underwater ambient-noise spectra and amplitude distributions are described for data acquired during field experiments made in the spring, late summer, and winter within the Canadian Arctic Archipelago. Measurements in each case were made using a bottom-mounted hydrophone. The ice cover was fast to the shore during the spring and winter experiments. In the summer experiment, the ice cover, although 10/10, was free to move. The ambient noise was generally impulsive and at times highly non-Gaussian. The significant ice, surface cracks as a result of thermal stresses were important; for late summer ice, relative motion of the floes was important. (Author)

**AD-628 305 Fld. 20/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*MICROWAVE LAB STANFORD UNIV CALIF*
**SELECTED STUDIES IN MICROWAVE ACOUSTICS.**
Final rept., 1 Mar-30 Sep 65,
by H. J. Shaw. Nov 65, 40p. Rept. no. ml-1382,
Contract AF 19 (628)-4788, Proj. AF-4600, Task 460003,
AFCRL 65-920
Unclassified report

Descriptors: (*Mechanical waves, Microwave frequency), (*Transducers, Acoustic equipment), (*Focusing, Mechanical waves), Ferrites, Ultrasonic radiation, Deflection, Magnetic fields, Piezoelectric transducers, Yttrium compounds, Iron compounds, Garnet

Controlled steering of the direction of a microwave acoustic beam in a ferrite by variation of the magnitude of the dc applied magnetic field was demonstrated. In a ferrimagnetic medium the interaction of acoustic waves with spin waves induces a deviation of the group velocity away from the phase velocity. This effect was demonstrated experimentally by the observation of pulse transmission between offset piezoelectric transducers on the ends of an yttrium iron garnet rod. Transmission occurs under the theoretically predicted conditions on magnetic field intensity and direction. The power-output versus frequency of multiple film hypersonic transducers was calculated by separate computer programs for certain specialized film configurations. A more generalized computer program was developed which is capable of treating configurations of films which are completely arbitrary with respect to material, physical thickness, and ordering of films used. This program assumes no power loss in the materials. Examples of the results of this program are described. (Author)

**AD-628 671 Fld. 20/1**
**CFSTI Prices: HC $6.00 MF $1.25**
*HARVARD UNIV CAMBRIDGE MASS ACOUSTICS RESEARCH LAB*
**FINITE-AMPLITUDE TRAVELING WAVES WITH BOUNDARY DISSIPATION.**
Technical memo.,
by Stephen H. Burns. Jan 66, 250p. Rept. no. TM-60,
Contract Nonr-1866 (24), Proj. NR-384-903,
Unclassified report

Descriptors: (*Acoustics, Pipes), Sound, Propagation, Air, Harmonic analysis, Nonlinear systems, Partial differential equations, Boundary layer, Attenuation

Measurements have been made of the harmonic distortion of progressive waves that have initial peak pressures from 0.001 to 0.1 atmospheres at a fundamental frequency of 445 c/s. These signals were propagated in air contained by a tube of diameter 1.587 cm, 2.66 cm, or 5.26 cm. Each tube was terminated with a matched load after seven wavelengths or before the experimental shock-formation distance, whichever came first. Up to thirty harmonics, whose amplitudes were within 60 dB of the initial pressure, were measured near the shock-formation distance. The measurements of the first four harmonics are compared with a correct-through-fourth-order perturbation solution of the compressible, Navier -Stokes equations. Since boundary dissipation is much more important than mainstream dissipation of the experimental circumstances of interest, only boundary dissipation is included in this solution. The theory is confirmed in all essential details. (Author)

**AD-628 326 See Fld. 17/1**

**AD-628 426 See Fld. 7/4**

**AD-628 450 See Fld. 9/1**

**AD-628 486 See Fld. 9/5**

**AD-628 487 See Fld. 9/1**

**AD-628 488 See Fld. 9/1**

**AD-628 572 See Fld. 7/4**

**AD-628 653 See Fld. 20/11**

**AD-628 830 See Fld. 7/4**

## 20/2. CRYSTALLOGRAPHY

**AD-628 362 Fld. 20/2**
*HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF PHYSICS*
**A METHOD FOR E. P. R. MEASUREMENTS OF ORTHORHOMBIC SITES IN A CRYSTAL OF TETRAGONAL SYMMETRY,**
by J. Bronstein, and V. Volterra. 21 Apr 65, 5p.
Contract AF-EOAR-63-64,
AFOSR 65-2545
Unclassified report

*Availability: Published in Physical Letters v16 n3 p211-2 1 Jun 1965. Copies to DDC users only.*

Descriptors: (*Crystal lattices, Paramagnetic resonance), (*Paramagnetic resonance, Crystal lattices), Symmetry (Crystallography), Tensor analysis

A method is described by which the g-tensor of an orthorhombic site can be measured in case of a crystal of tetragonal symmetry. The method is applicable only for ions with Kramers doublets and with a small or no hyperfine interaction. The method can also be applied to crystal systems of other symmetries.

**AD-628 520 Fld. 20/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*CORNELL UNIV ITHACA N Y DEPT OF ENGINEERING PHYSICS*
**INVESTIGATIONS OF ATOMIC PHENOMENA OCCURRING ON OR NEAR THE SURFACE OF SOLIDS BY METHODS OF ULTRA HIGH VACUUM ELECTRON DIFFRACTION AND ELECTRON MICROSCOPY.**
Final scientific rept.,
by Benjamin M. Siegel. 1966, 7p. Contract AF-

AFOSR-62-7, Proj. AF-9761, Task 976103, AFOSR 66-0152

Unclassified report

Descriptors: (*Crystal structure, Surface properties), (*Electron diffraction analysis, Crystal structure), (*Electron microscopy, Crystal structure), Vacuum, Crystal growth, Atomic properties

Publications are listed for these categories: Transmission electron diffraction of films deposited in ultra high vacuum, behavior under heat treatment, and the nucleation and growth of the oxide phase; Reflection electron diffraction on single crystals, and the nucleation and growth of the oxide phase on different crystal faces; Electron microscope characterization of the structure and surface of films deposited and replicated in ultra high vacua; Nucleation and growth of crystallites deposited from vapor phase on 'clean' substrates; Replication of single crystal surfaces by the ultrahigh vacuum process for surface characterization and investigation of growth phenomena on the surface by electron microscopy.

**AD-628 569 Fld. 20/2, 7/2, 7/3**
*UNIVERSITY OF WESTERN ONTARIO LONDON DEPT OF CHEMISTRY*
**STRUCTURES OF MERCURY MERCAPTIDES. PART II. X-RAY STRUCTURAL ANALYSIS OF MERCURY ETHYLMERCAPTIDE.**
Technical rept.,
by D. C. Bradley, and N. R. Kunchur. 16 Nov 64, 10p. Rept. no. TR-3,
Contract Nonr-3325 (00), Proj. NR-052-426,

Unclassified report

See also AD-416 547.

*Availability: Published in Canadian Journal of Chemistry v43 p2786-92 1965. Copies to DDC users only.*

Descriptors: (*Mercury compounds, Thiols), (*Organic sulfur compounds, Crystal structure), (*Metalorganic compounds, Crystal structure), X-ray diffraction analysis, Crystal lattices, Molecular association, Chemical bonds, Canada

The unit cell parameters for Hg (SC2H5)2 were determined by X-ray diffraction: a = 7.54 plus or minus 0.02; b = 4.87 plus or minus 0.01; c = 23.80 plus or minus 0.04 A; beta = 85 degrees. The unit cell contains four formula units, and a complete structural analysis revealed a molecular lattice with insignificant intermolecular bonding involving mercury and sulfur. Interatomic distances (excluding C-H) were determined. (Author)

**AD-628 604 Fld. 20/2, 8/7**
*ARMY ELECTRONICS LABS FORT MONMOUTH N J*
**MIXED-LAYER POLYTYPES RELATED TO MAGNETOPLUMBITE,**
by J. A. Kohn, and D. W. Eckart. 1 Feb 65, 11p.

Unclassified report

*Availability: Published in American Mineralogist, v50 p1371-80 Sep 1965. Copies to DDC users only.*

Descriptors: (*Ferrites, Crystal structure), Barium compounds, Zinc compounds, Iron compounds, Oxides, Crystal lattices, X-ray diffraction analysis

Thirteen new, discrete rhombohedral and hexagonal layer structures, of the type Ba (w)Zn (y)Fe (w)O (z) were identified during an x-ray diffraction study of 'hexagonal ferrite' single crystals. They consist of an ordered c-axis stacking of two five-anion-layer substituted magnetoplumbite units (BaFe12O19;M) with a variable number of closely related six-layer units (Ba2Zn2Fe12O22;Y). An M2Y (n) series (n=1-10) is generated, in which all unit cells have a common basal section (a=5.88A) and hexagonal c varies up to 505.4A. For a given M2:Yyn ratio, mixed -layer polytypes form by permutation of the M and Y units along c. Well-resolved Weissenberg patterns and 00.1 diffractometer traces were obtained. The latter furnished relative intensities for use with one-dimensional structure-factor calculations to establish stacking structures from among qualiifying models. (Author)

**AD-628 643 Fld. 20/2**
*OKLAHOMA STATE UNIV STILLWATER DEPT OF PHYSICS*
**PHOTOELECTRONIC ANALYSIS OF IMPERFECTIONS IN GROWN STANNIC OXIDE SINGLE CRYSTALS,**
by Jack E. Houston, and E. E. Kohnke. 28 Jun 65, 9p. Contract Nonr-2595 (01),

Unclassified report

*Availability: Published in Journal of Applied Physics, v36 n12 p3931-8 Dec 1965. Copies to DDC users only.*

Descriptors: (*Tin compounds, Oxides), (*Crystal lattice defects, Tin compounds), Single crystals, Heat of activation, Thermal properties, Crystal growth, Optical analysis

A study of the imperfection properties of grown stannic oxide single crystals was made using photoelectronic techniques. The primary objective has been to propose an energy level scheme for defects in these samples based on the results of measurements of spectral response, thermally stimulated currents, thermal quenching, and dark conductivity as a function of temperature. Measurements of thermally stimulated current indicated the existence of three trapping levels with average activation energies of 0.21, 0.52, and 0.60 eV. Comparision with dark conductivity data implied the 0.60-eV trap to be associated with the compensated portion of those donor states responsible for the normal n-type conductivity. Extrinsic thermal quenching results established that these levels were all trapping states for electrons, with the two shallow ones completely compensated and the deeper one only partially compensated. Theesults of intrinsic thermal quenching measurements indicated the existence of a compensated acceptor level lying 0.33 eV above the valence band and acting under certain conditions as a sensitizing center. The ratio of hole to electron capture cross sections for this level was found to be 700. Also found were more-or-less discrete levels having optical activation energies of approximately 1.0, 1.3, and 1.8 eV. These levels were determined from spectral response measurements which, in addition, show the existence of other unresolved levels lying further from the conduction band than 2.0 eV and a fundamental absorption edge at 4.0 eV. (Author)

**AD-628 849 Fld. 20/2**
**CFSTI Prices: HC $1.00 MF $0.50**
*RESEARCH AND ADVANCED DEVELOPMENT DIV AVCO CORP WILMINGTON MASS*
**GRAIN BOUNDARY DIFFUSION IN MGO: ORIGIN OF THE EFFECT,**
by B. J. Wuensch, and T. Vasilos. 1965, 16p.
Contract Nonr-4267 (00)

Unclassified report

Descriptors: (*Grain boundaries, Diffusion), (*Magnesium compounds, Oxides), Crystals, Impurities, Calcium, Silicon, Iron, Nickel, Cobalt, Single crystals

Preferential diffusion of Ni (2+) and Co (2+) along grain boundaries has been observed in certain bicrystals of MgO. This enhancement is due to impurity segregation at the boundary. The impurities responsible for the effect are the principal impurities contained within the single-crystal MgO: Ca, Si, and Fe. No enhancement has been observed in any bicrystal prepared above 1300C. This temperature corresponds to that at which studies of the mechanical properties of MgO have implied a reabsorption of impurity precipitates into solid solution. It is concluded that enhanced grain-boundary diffusion of cations in MgO is an extrinsic, rather than an intrinsic property of the boundary. (Author)

**AD-628 363 See Fld. 20/12**

**AD-628 375 See Fld. 20/8**

**AD-628 396 See Fld. 11/2**

**AD-628 453 See Fld. 20/12**

**AD-628 455 See Fld. 20/12**

**AD-628 503 See Fld. 11/9**

**AD-628 514 See Fld. 11/6**

**AD-628 632 See Fld. 20/12**

**AD-628 793 See Fld. 20/12**

**AD-628 861 See Fld. 20/6**

## 20/3. ELECTRICITY AND MAGNETISM

**AD-628 075 Fld. 20/3, 7/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*MITHRAS INC CAMBRIDGE MASS*
**INVESTIGATION OF THE DYNAMIC PROPERTIES OF PHASE TRANSITIONS OF ORDERED MAGNETIC STATES.**
Final rept. Oct 62-Oct 65,
by Charles S. Naiman, and Thomas R. Lawrence. Oct 65, 75p. Rept. no. MC-62-49-R6,
Contract AF19 (628)2395, Proj. AF-4608 Task AF-460805,
AFCRL 66-16

Unclassified report

Descriptors: (*Magnetic properties, Phase studies), (*Molecular spectroscopy, Transition elements), Magnetic fields, Spin, Relaxation time, Field theory, Crystal lattice defects, Ultraviolet spectroscopy, Absorption spectrum, Fluorescence, Optical properties, Ruby, Chromium, Ions

Research is reported on the properties of magnetic phase transitions. A survey was made of experiments were suggested which should be useful in their study: and several of these experiments were performed on the spin flop transition in antiferromagnetic CuCl2.2H2O. The components were measured of the susceptibility tensor relating to the perpendicular magnetization and obtained data in approximate agreement with a theoretical analysis based on the molecular field approximation. Research is reported on the optical properties of transition metal ions in crystalline solids. The spectrum of heavily doped ruby was and found narrow absorption bands in the ultra violet, which are shown to be cooperative absorption by pairs of Cr (3+) ions. The fluorescent spectrum of heavily doped ruby, the excitation spectrum of chromium doped spinels, and the absorption by chromium ions in the metastable state in ruby were studied.

**AD-628 114 Fld. 20/3, 9/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB*
**CALCULATIONS CONCERNING ELECTRICAL BREAKDOWN INDUCED BY THE MELTING OF MICROSCOPIC PROJECTIONS,**
by Donald A. Lee. Jan 66, 40p. Rept. no. Rept. no. R-280,
Contract DA-28-043-AMC-00073 (E),NGR-14-005-038 Proj. DA-20014501B31F

Unclassified report

Descriptors: (*Cathodes, Failure (Electronics), (*Field emission, Cathodes), Tungsten, Electrodes, Surface area, Roughness, Melting, Leakage (Electrical), Vacuum

Calculations have been made concerning electrical breakdown induced by the melting of microscopic projections on the cathode surface. A digital computer analysis of tungsten shown a surprising correlation between measured electrical breakdown fields and the fields necessary to melt tungsten projections. (Author)

**AD-628 189 Fld. 20/3**
*BELL TELEPHONE LABS INC MURRAY HILL N J*
**CONDUCTION-ELECTRON POLARIZATION IN METALS,**
by R. E. Watson, and A. J. Freeman. 1 Mar 65, 7p. Contract AF 49 (638)-1468, Proj. AF-9764, AFOSR 65-2567

Unclassified report

Prepared in cooperation with National Magnet Lab., Mass. Inst. of Tech., Cambridge.

*Availability: Published in Physical Review Letters v14 n17 p695-8 Apr 26 1965. Copies to DDC users only.*

Descriptors: (*Metals, Polarization), Magnetic properties, Magnetic resonance, Electron spin resonance, Theory

**AD-628 259 Fld. 20/3**
*NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE*
**ULTRASTRONG MAGNETIC FIELDS,**
by Francis Bitter. 1965, 11p. Contract AF 49 (638)-1468, AFOSR 65-2587

Unclassified report

*Availability: Published in Scientific American v213 n1 p64-73 Jul 1965. Copies to DDC users only.*

Descriptors: (*Magnetic fields, Production), High-pressure research, Explosions, Atomic structure, Cyclotron waves

**AD-628 338 Fld. 20/3, 20/12**
*NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE*
**EFFECTIVE CONDUCTION ELECTRON LOCAL MOMENT INTERACTION IN METALS: RARE-EARTH INTERBAND MIXING,**
by A. J. Freeman, R. E. Watson, S. Koide, and M. Peter. 8 Feb 65, 15p. Contract AF 49 (638)-1468, Proj. AF-9764, AFOSR 65-2027

Unclassified report

Prepared in cooperation with Bell Telephone Labs. Inc., Murry Hill, N. J. and Geneva Univ. (Switzerland).

*Availability: Published in Physical Review, v139 n1A pA167-78 Jul 5, 1965. Copies to DDC users only.*

Descriptors: (*Electrical conductance, Electrons), (*Magnetic moments, Electrons), (*Band theory of solids, Rare earth elements), Atomic energy levels, Polarization, Metals

The effective diagonal-exchange parameter J which determines the exchange splitting of a metal's Fermi-surface conduction electrons, has been investigated with a model involving simple orthogonalized plane-wave conduction-electron orbitals and rare-earth ion cores. The positive exchange integral and negative interband mixing contributions to J have been estimated for the rare earths as a function of nuclear charge Z. The results indicate that interband mixing may dominate, causing a net negative conduction-electron polarization, in agreement with a number of experiments. The interband mixing, and hence the sign of J, is found to be very sensitive to conduction-electron character. The results also indicate that, for ions other than spherical Gd, the parameter J will vary strongly with conduction-electron k direction (with respect to the J of the rare-earth ion) and may even involve a variation in sign. Such anisotropies in J and the nondiagonal J (Q) parameters should be a significant source of anisotropies in the Ruderman Kittel Kasuya Yosida conduction-electron spin distribution. (Author)

**AD-628 344 Fld. 20/3, 20/13**
*NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE*
**WIEDEMANN-FRANZ LAW IN THE QUANTUM LIMIT FOR ISOTROPIC SCATTERING.**
Revised ed.,
by J. Zak. 14 Jan 65, 10p. Contract AF 49 (638)-1468, AFOSR 65-2030

Unclassified report

Revision of manuscript submitted 7 Oct 64.

*Availability: Published in The Journal of Physics and Chemistry of Solids, v26 p1021-7 1965. Copies to DDC users only.*

Descriptors: (*Transport properties, Magnetic fields), (*Heat transfer, Magnetic fields), (*Magnetic fields, Thermal conductivity), Quantum mechanics, Magnetic properties, Electric currents, Low-temperature research

A temperature gradient is introduced into the density matrix equation by analogy with the Boltzmann transport equation. The electric and heat currents are defined in the case of isotropic scattering, in which particular case, it is shown that the WiedemannFranz law holds even in the details of the oscillations of both the electric and thermal conductivities. (Author)

**AD-628 345 Fld. 20/3**
*NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE*
**DIELECTRIC CONSTANT OF HE3 IN THE CRITICAL REGION,**
by C. E. Chase, and G. O. Zimmerman. 2 Aug 65, 5p. Contract AF 49 (638)-1468, AFOSR 65-2566

Unclassified report

Prepared in cooperation with Boston Univ., Mass. Dept. of Physics.

*Availability: Published in Physical Review Letters, v15 n11 p483-5 Sep 13 1965. Copies to DDC users only.*

Descriptors: (*Liquefied gases, Helium), (*Helium, Dielectric properties), Cryogenics, Radioactive isotopes, Equations of state, Transition temperature, Capacitors, Density, Pressure

A systematic study was undertaken of the equation of state of He3, for the purpose of investigating certain quantum corrections in detail. A dielectric-constant technique was employed in which the density of a very thin layer of fluid (about 0.002 cm thick), contained between the plates of a condenser, is derived from the measured change in capacitance as the condenser is filled. Measurements are reported of the density along the critical isotherm, which we believe to be substantially free from the objections of previous methods. The measurements show that Delta=3.49=0.1 over a very wide range of pressure, confirming the existence of substantial deviations from the law of corresponding states. Considerable asymmetry was also found between the high-density and low-density sides of the critical isotherm.

**AD-628 347 Fld. 20/3, 20/9**
*STD RESEARCH CORP PASADENA CALIF*
**BREAKDOWN VOLTAGE CALCULATION FOR AIR IN UNIFORM FIELDS,**
by A. N. Kontaratos. 20 Apr 64, 12p. Contract AF 49 (638)-1445, AFOSR 65-2504

Unclassified report

*Availability: Published in Appl. Sci. Res. secB v12 p18-26 1964. Copies to DDC users only.*

Descriptors: (*Air, Electrical discharges), (*Electrical discharges, Air), Space charges, Electric fields, Sparks, Voltage, Dipole moments, Gas ionization

Expressions are derived for the determination of the space-charge field in front of an avalanche, for the widening of the avalanche's head due to electrostatic repulsion and for the minimum breakdown voltage of uniform gaps. In principle, this last condition is based on a modification of the criterion for streamer advance developed by Raether, Meek et. al. An attempt is made to consider the avalanche as an electric dipole oriented in a direction parallel to the applied field and use is made of the radial instead of the axial field of the avalanche's head. (Author)

**AD-628 400 Fld. 20/3**
*CATHOLIC UNIV OF AMERICA WASHINGTON D C*
**APPLICATION OF THE METHOD OF THE TWO-TIME GREEN'S FUNCTION TO THE HEISENBERG FERROMAGNET, II,**
by Tohru Morita, and Tomoyasu Tanaka. 28 Dec 64, 11p. Contract AF-AFOSR-445-63, AFOSR 65-2816

Unclassified report

Prepared in cooperation with Naval Ordnance Lab., White Oak, Md. See also AD-620 831.

*Availability: Published in The Physical Review v138 n5A pA1395-A1402 31 May 1965. Copies to DDC users only.*

Descriptors: (*Ferromagnetism, Green's function), Hamiltonian, Nuclear spins, Statistical functions

The method of the two-time Green's function is applied to the Heisenberg ferromagnet. The equations of motion for the lowest order and the next higher order Green's functions are solved in an approximation which leads to the first nonvanishing contribution of the spin-wave interaction to the spontaneous magnetization at low temperatures. It is shown that this contribution is of order T to the 4th power and is the same as Dyson's result. (Author)

**AD-628 434 Fld. 20/3, 20/12**
*CALIFORNIA UNIV LA JOLLA DEPT OF PHYSICS*
**SELF-CONSISTENT TREATMENT OF KONDO'S EFFECT IN DILUTE ALLOYS,**
by Yosuke Nagaoka. 7 Dec 64, 11p. Contract AF-AFOSR-610-64, AFOSR 65-2534

Unclassified report

*Availability: Published in The Physical Review v138 n4A pA1112-20 17 May 1965. Copies to DDC users only.*

Descriptors: (*Electrical conductance, Alloys), (*Alloys, Band theory of solids), Transport properties, Electrons, Impurities, Perturbation theory, Resistance (Electrical), Specific heat

How conduction electrons in dilute alloys are affected by the exchange interaction with localized spins of impurities is investigated. It is shown that, if the interaction is antiferromagnetic, the perturbational treatment breaks down below a critical temperature, and that near the Fermi surface there appears a quasi-bound state between the conduction-electron spin and the localized spin. Because

of the appearance of this quasibound state, the resistivity increases with decreasing temperature, but has a finite value at T =0. There is no logarithmic term in the resistivity at low temperatures, in contrast to Kondo's theory of the resistance minimum. There also appears an anomaly in the specific heat at low temperatures. (Author)

**AD-628 122** See Fld. 20/12

**AD-628 321** See Fld. 20/12

**AD-628 346** See Fld. 20/12

**AD-628 437** See Fld. 20/12

**AD-628 467** See Fld. 20/9

**AD-628 523** See Fld. 7/4

**AD-628 546** See Fld. 9/4

**AD-628 559** See Fld. 10/2

**AD-628 606** See Fld. 20/12

**AD-628 608** See Fld. 20/12

**D-628 633** See Fld. 17/9

**AD-628 634** See Fld. 20/12

**AD-628 711** See Fld. 9/4

**AD-628 728** See Fld. 20/12

## 20/4. FLUID MECHANICS

**AD-628 083 Fld. 20/4**
**CFSTI Prices: HC $4.00 MF $0.75**
*MINNESOTA UNIV MINNEAPOLIS HEAT TRANSFER LAB*
**HOT-WIRE ANEMOMETER STUDY OF A TURBULENT BOUNDARY LAYER ON A POROUS AXIAL CIRCULAR CYLINDER WITH UNIFORM AIR INJECTION.**
Scientific rept.,
by V. K. Jonsson, and W. D. Batton. Sep 65, 104p. Rept. no. HTL-TR-65,
Contract AF-AFOSR-17-65, Proj. AF-9781, Task 978102,
AFOSR 65-2724

Unclassified report

Descriptors: (*Turbulent boundary layer, Cylindrical bodies), Anemometers, Porous materials, Velocity, Reynolds number, Stresses, Friction, Injection, Correlation techniques

The report deals with a hot-wire anemometer study of a turbulent boundary layer on a porous axial cylinder with a free stream velocity of 120 feet per second. The variations through the boundary layer of the transverse and longitudinal fluctuating velocity components, the Reynolds stress, the turbulent friction coefficient, and the correlation coefficient were obtained at axial Reynolds numbers of 400,000, 600,000, and 900,000. Two cases of injection with air were studied in addition to the case of no injection. The value of the dimensionless injection rate was 0, 0.000084, and 0.00020. (Author)

**AD-628 098 Fld. 20/4**
**CFSTI Prices: HC $1.60 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**CONVECTIVE INSTABILITIES IN FULLY DEVELOPED FLOWS,**
by M. Sherman. Feb 66, 13p. Rept. no. P-3308,

Unclassified report

Descriptors: (*Incompressible flow, Secondary flow), (*Secondary flow, Convection (Heat transfer)), (*Convection (Heat transfer), Secondary flow), Fluid mechanics, Thermodynamics

This paper considers the possibility of inducing a convective secondary flow in the fully developed channel flow of a quasi-incompressible (Boussinesq) fluid. Instabilities of this type can only occur when the temperature gradient in the direction of the body force exceeds a certain critical value. This temperature gradient is proportional to the Rayleigh number of the fluid. For channels of arbitrary cross section, the critical Rayleigh number is found to be R sub c > or = 1360 (h/d) to the 4th power where h is the arbitrary channel's maximum dimension in the body force direction and d is the diameter of an equal area circular channel. For two special geometries it is possible to improve the above lower bound estimate to the critical Rayleigh number. In a circular channel R sub c > or = 3450 and in a square channel R sub c > or = 2480. (Author)

**AD-628 132 Fld. 20/4**
**CFSTI Prices: HC $1.60 MF $0.50**
*AREOCHEM RESEARCH LABS INC PRINCETON N J*
**CONTRIBUTIONS TO THE THEORY OF INTERFACIAL RATE PROCESSES IN FLOW SYSTEMS.**
Final rept. 11 Dec 61-10 Dec 65,
by Daniel E. Rosner. 27 Dec 65, 13p. Rept. no. AeroChem-TP-126,
Contract AF 49(638)-1138, Proj. AF-9750 Task 975001,
AFOSR 65-2943

Unclassified report

Descriptors: (*Fluid flow, Surface properties), Diffusion, Convection (Heat transfer), Boundary layer, Chemical reactions, Catalysis, Ablation, Heat transfer, Mass transfer

A synopsis is presented of a four-year basic research program on the theory of interfacial rate processes in flow systems. A chronological list is provided of sixteen resulting publications relevant to: (1) interpretation of arc-tunnel and combustion torch test results (heat flux, ablation rates), (2) design of advanced re-entry heat protection systems (radiation, transpiration cooling), (3) instrumentation for probing high-speed flows for local atom concentrations, (4) determination of heterogeneous kinetic constants in flow reactors, and (5) extensions of heat-mass transfer theory. (Author)

**AD-628 142 Fld. 20/4**
*POLITECNICO DI TORINO (ITALY) ISTITUTO DI MECCANICA APPLICATA*
**DISSOCIATION EFFECTS ON THE STAGNATION REGION PAST AN AXISYMMETRIC BLUNT BODY IN A HIGH MACH NUMBER AND LOY REYNOLDS NUMBER HYPERSONIC FLOW.**
Technical note,
by Aldo Muggia. Jul 65, 8p. Rept. no. Scientific-7,TN-31
Contract AF-EOAR-98-63, Proj. AF-9783, Task 978301,
AFOSR 65-2294

Unclassified report

*Availability: Published in Libreria Editrice Universitaria Levrotto and Bella - Torino p1-4 1965. Copies to DDC users only.*

Descriptors: (*Dissociation, Hypersonic flow), (*Stagnation point, Dissociation), (*Hypersonic characteristics, Blunt bodies), Axially symmetric flow, Temperature, Aerodynamic heating, Velocity, Catalysis, Italy

The study on the stagnation region past an axisymmetric blunt body in a low Reynolds number hypersonic flow is accomplished with some numerical results at Mach number 20. The behaviour of temperature, velocity and atom concentration is shown, as well as the effects of the wall catalytic efficiency on the aerodynamic heating. (Author)

**AD-628 160 Fld. 20/4, 1/1**
**CFSTI Prices: HC $4.60 MF $0.50**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C AERODYNAMICS LAB*
**LONGITUDINAL AERODYNAMIC CHARACTERISTICS OF SEVERAL HYPERSONIC AIRCRAFT CONFIGURATIONS AT A MACH NUMBER OF 9.45,**
by John R. Krouse, and Bertram K. Ellis. Jan 66, 47p. Rept. no. Aero-1099,
Task RAD-34B-001/440-1/F012-01-06, DTMB 2153

Unclassified report

Descriptors: (*Aerodynamics, Hypersonic planes), (*Hypersonic planes, Aerodynamic characteristics), Wind tunnels, Hypersonic flow, Model tests, Aerodynamic configurations, Hypersonic characteristics

Wind-tunnel tests were conducted at a Mach number of 9.45 to determine the longitudinal aerodynamic characteristics of several conceptual hypersonic aircraft configurations, consisting of various half-cone-cylinder bodies and double-delta wings. Effects of body volume, vehicle orientation, wing planform, and wing-tip dihedral were determined. In general, the lift-to-drag ratios of all high-wing configurations varied slightly over an angle-of-attack range of 0 degrees to 12 degrees, reaching a maximum value of 2.7 around 6 degrees. On the other hand, the lift-to-drag ratios of all low-wing configurations increased continuously with increasing angle of attack, eventually reaching maximum values of roughly 3.0 near 12 degrees. In all cases, fuselage base drag accounted for less than 4 percent of the total drag. For the arbitrarily chosen center-of-gravity location, all low-wing configurations were unstable, unbalanced, or both; whereas several high-wing configurations were both stable and balanced. (Author)

**AD-628 161 Fld. 20/4**
**CFSTI Prices: HC $1.60 MF $0.50**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C HYDROMECHANICS LAB*
**THE FORCE AND MOMENT ON A SLENDER BODY OF REVOLUTION MOVING NEAR A WALL,**
by J. Nicholas Newman. Dec 65, 16p. Proj. S-R011-01-01, Task 0401
DTMB 2127

Unclassified report

Descriptors: (*Bodies of revolution, Slender bodies), (*Slender bodies, Force (Mechanics)), (*Pitch (Motion), Bodies of revolution), Hydrodynamics, Potential theory, Walls

Analytical results are derived for the vertical force and pitch moment acting on a body of revolution which is moving with constant forward velocity parallel to an infinite horizontal wall. It is assumed that the fluid is ideal and incompressible and that the body is slender and situated close to the wall. The force and moment are given in terms of simple integrals involving the body shape and separation distance from the wall. Calculations are made for a spheroid, and it is shown that the vertical force rises rapidly as the body is brought progressively closer to the wall. (Author)

**AD-628 182 Fld. 20/4**
**CFSTI Prices: HC $3.60 MF $0.50**
*VON KARMAN INST FOR FLUID DYNAMICS RHODE-SAINT-GENESE (BELGIUM)*
**LAMINAR SEPARATION IN SUPERSONIC AND HYPERSONIC FLOWS.**
Final rept. 1 Nov 64-31 Oct 65,
by Jean J. Ginoux. Oct 65, 32p. Contract AF-EOAR-11-65,
AFOSR 65-2715

Unclassified report

Descriptors: (*Flow separation, Laminar flow), (*Supersonic flow, Flow separation), (*Hypersonic flow, Flow separation), Vortices, Boundary layer, Leading edge, Heat transfer, Aerodynamic heating, Swept-back wings

High speed two-dimensional reattaching flows are characterized by the development of regularly spaced vortices in the boundary layer, whose effect is to produce heat transfer rates at reattachment which are, locally over the span, considerably higher in laminar and transitional flows than in the turbulent case. These results are expected to occur both at supersonic and hypersonic speeds, as these vortices were observed over a range of Mach numbers of 1.5 to 7.0. A basic difference in the recovery of total energy at reatachment was observed between laminar and transitional flows over ramps. In the latter case, the recovery temperature was maximum at reattachment and decreased to the laminar theoretical value in a region downstream of reattachment, where the flow was turbulent. The aerodynamic heating of sweptback wings can be predicted by a simple method derived from flat plate theory and by superimposing flow components parallel and perpendicular to the leading edge. Streamwise vortices do not seem to affect the average heat transfer coefficient. (Author)

**AD-628 224 Fld. 20/4**
**CFSTI Prices: HC $12.60 MF $1.00**
*MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB*
**EFFECT OF VORTEX SEPARATION ON LIFTING BODIES OF ELLIPTIC GROSS SECTION.**
Technical rept.,
by Leon H. Schindel. Sep 65, 130p. Rept. no. TR-118,DSR-5139
Contract N600(19)61720,
Unclassified report

Descriptors: (*Flow separation, Aerodynamic configurations), Vortices, Lift, Model theory, Programming (Computers), Potential theory

The lift on slender bodies at high angle of attack is strongly influenced by the separation of a pair of vortices from the lee side. Of the various possible methods for taking account of this vortex separation, that proposed by Bryson seems to incorporate the main features of the flow in the simplest mathematical form. In this model, the separated vortices are joined to the body by straight feeding sheets. Bryson gives solutions for the vortex strength and position as a function of time or distance along the body and calculates the resulting body normal force for circular cones and cylinders. These solutions are extended here to cambered bodies of elliptic cross section having arbitrary nose contour. Calculation of the development of the separated vortices requires specification of the angular position around the body at which the feeding sheet departs. The position of this separation line is determined here from a correlation of experimental results. An analytic procedure is also described, but its accuracy is considered to be inadequate. In order to complete the theory, the initial growth of the vortices as they first leave the surface must also be prescribed. Vorticity is assumed to accumulate within the boundary layer until it separates upon reaching a certain finite strength which depends on whether the boundary layer is laminar or turbulent at separation.

**AD-628 233 Fld. 20/4, 20/13**
**CFSTI Prices: HC $3.60 MF $0.50**
*MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB*
**HIGH SPEED VISCOUS, REACTING AND RADIATING FLOWS.**
Final rept. Jul 64-Oct 65.
Nov 65, 35p. Rept. no. TR-127,DSR-5170
Contract AF-AFOSR-641-64,
AFOSR 65-2713
Unclassified report

Descriptors: (*Hypersonic flow, Thermal radiation), (*Thermal radiation, Hypersonic flow), (*Atmosphere entry, Slender bodies), Viscosity, Heat transfer, Shock waves, Nonequilibrium flow, Boundary layer, Shear stresses

Contents: Nonequilibrium flow fields due to prescribed piston motions; Radiation effects in one-dimensional problems; Radiation problems using integral methods and parametric differentiation; Radiation coupled viscous flow; Laminar mixing of streams in presence of a pressure gradient.

**AD-628 287 Fld. 20/4**
**CFSTI Prices: HC $3.60 MF $0.50**
*CINCINNATI UNIV OHIO HYPERSONIC AERODYNAMICS RESEARCH STAFF*
**A SURVEY OF ASYMPTOTIC SERIES SOLUTIONS TO THE BOUNDARY LAYER EQUATIONS.**
Interim rept. Jun 64-Jun 65,
by Philip S. Kirk, and Ting Y. Li. Dec 65, 37p. Contract AF 33(616)-8453, Proj. AF-7064, ARL 65-244
Unclassified report

Descriptors: (*Boundary layer, Asymptotic series), Equations, Numerical analysis, Computers, Transformations (Mathematics)

The paper presents a summary of the asymptotic series method for solving approximately the boundary layer equations. The principles and restrictions of the method are discussed in detail, together with a brief survey of the previous papers that have utilized this method. The present discussion indicates the types of boundary layer problems that are susceptible to this treatment, and the reasons for these limitations. The mathematical techniques upon which these analyses rely, such as the method of steepest descent, and the Euler Transformation, are treated in detail and are related to the aforementioned limitations. Also the use of asymptotic series together with numerical computer calculations is discussed briefly, indicating possible lines of advancement. (Author)

**AD-628 303 Fld. 20/4, 1/1**
**CFSTI Prices: HC $3.60 MF $0.50**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**WINGS IN HYPERSONIC FLOW,**
by G. G. Chernyi. 15 Feb 66, 38p. Rept. no. FTD-MT-65-566,
TT 66-60579
Unclassified report

Edited machine trans. of Prikladnaya Matematika i Mekhanika (USSR) v29 n4 p616-34 1965.

Descriptors: (*Wings, Hypersonic flow), (*Hypersonic flow, Wings), Theory, Mathematical analysis, Fluid mechanics, Shock waves, Partial differential equations, Numerical methods + procedures, USSR

**AD-628 356 Fld. 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY MISSILE COMMAND REDSTONE ARSENAL ALA ADVANCED SYSTEMS LAB*
**BASE PRESSURE PROGRAM FOR A BODY OF REVOLUTION WITH NOZZLE FLOW,**
by Troy A. Street. 15 Jan 64, 39p. Rept. no. RF-TM-64-2,
Proj. DA-1-B-2-22901-A-206,
Unclassified report

Descriptors: (*Programming (Computers), Fluid mechanics), (*Base pressure, Bodies of revolution), Base flow, Nozzle gas flow, Two-dimensional flow, Graphics

An IBM 7090 Digital Computer program to predict the base pressure of a body containing nozzle with flow has been developed. The program offers a two-dimensional solution by assuming constant pressure, turbulent viscous mixing, and a fully developed isoenergetic profile. Two comparisons of the program results with experimental data are discussed and presented in graphical form. The predicted values of base pressure show the correct trend and agree with experimental values. (Author)

**AD-628 386 Fld. 20/4**
**CFSTI Prices: HC $17.50 MF $1.00**
*SIBLEY SCHOOL OF MECHANICAL ENGINEERING CORNELL UNIV ITHACA N Y*
**AN EXPERIMENTAL AND ANALYTICAL STUDY OF HEAT TRANSFER AND PRESSURE DROP IN HORIZONTAL ANNULAR TWO-PHASE, TWO-COMPONENT FLOW.**
Interim rept.,
by R. H. Pletcher. 15 Sep 65, 179p. Contract DA-ARO(D)-31-124-G188, Proj. ARO(D)-3199-E,
AROD 3199:2
Unclassified report

Descriptors: (*Heat transfer, Two-phase flow), (*Two-phase flow, Heat transfer), Water, Air Fluid flow, Annular nozzles

The static pressure drop and both the local and average heat transfer coefficients were measured for the horizontal annular flow of water and air in a tube with an inside diameter of one inch. A correlation for the heat transfer coefficients was obtained. The pressure drop data agreed well with the Lockhart-Martinelli correlation and the prediction of the Wrobel-McManus wave roughness theory. A theory based on an axisymmetric model with no liquid entrainment was developed to allow predictions of local heat transfer coefficients. In comparing the predictions with the measured coefficients, 85% of the predictions were within plus or minus 60% of the measured values from horizontal flow and substantially better agreement resulted when the theory was modified empirically to take into account liquid entrainment and circumferential temperature variations. The theory was applied to conditions beyond the scope of the experimental program to predict the effects of varying heat flux, tube temperature, and tube diameter on the coefficients.

**AD-628 416 Fld. 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C*
**THE CALCULATIONS OF THE ANOMALIES OF V SUB DELTA FOR THREE-DIMENSIONAL BODIES BY A 'PALETTE' OF A TWO-DIMENSIONAL BODY,**
by Ya. A. Yunkov. 1965, 5p. Rept. no. TRANS-282,
TT 66-60600
Unclassified report

Obchislennya Anomalii V Nad Trivimirnimi Tilami Paletkoiu Dvovimirnoho Tila, trans. of Akademiya Nauk URSR, Kiev. Dopovidi, n10 p1393-5 1960.

Descriptors: (*Three-dimensional flow, Mathematical analysis), (*Two-dimensional flow, Mathematical analysis), (*Hydrodynamic configurations, Fluid dynamic properties), Aerodynamic configurations, Aerodynamic characteristics, Fluid mechanics, USSR

**AD-628 417 Fld. 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C*
**THE CALCULATION OF ANOMALIES VXZ OF THREE-DIMENSIONAL BODIES WITH A PALETTE OF A TWO-DIMENSIONAL BODY.**
by Ya. A. Yunkov. 1965, 5p. Rept. no. TRANS-283,
TT 66-60601
Unclassified report

Obchislennya Anomalii Vxz Nad Trimirnimi Tilami Paletkoiu Dvomirnogo Tila, trans. of Akademiya Nauk URSR, Kiev. Dopovidi, n10 p1224-6 1960.

Descriptors: (*Three-dimensional flow, Mathematical analysis), (*Two-dimensional flow, Mathematical analysis), (*Hydrodynamic configurations, Fluid dynamic properties), Aerodynamic configurations, Aerodynamic characteristics, Fluid mechanics, USSR

**AD-628 442 Fld. 20/4, 13/10.1**
**CFSTI Prices: HC $1.00 MF $0.50**
*DAVID TAYLOR MODEL BASIN WASHINGTON D C STRUCTURAL MECHANICS LAB*
**HYDROSTATIC PRESSURE TESTS OF CYLINDERS FABRICATED FROM HOLLOW-FILAMENT, GLASSREINFORCED PLASTIC,**
by John L. Proffitt. Dec 65, 18p. Proj. S-F013-05-03, Task 1025,
DTMB 2132

Unclassified report

Descriptors: (*Hydrostatic pressure, Model tests), (*Plastics, Cylindrical bodies), (*Deep submergence, Model tests), Glass, Reinforcing (Materials), Buckling (Mechanics), Stresses

Four pairs of unstiffened cylinders composed of filament-wound, glass-reinforced plastic were subjected to hydrostatic loading to determine the possible benefits to be gained through the use of hollow filaments. Three pairs had hollow-filaments with different ratios of inner diameter to outer diameter, (0.55, 0.57, and 0.62) and the remaining pair employed solid fibers. The results indicate that this hollow-filament material has excellent static strength-weight characteristics for deep-submergence applications. Before its feasibility can be fully established, however, further tests are needed, particular cyclic loading studies and tests involving models with structural details. (Author)

**AD-628 452 Fld. 20/4**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS*
**THE FLOW FIELD INDUCED BY AN OSCILLATING SPHERE.**
Revised ed.,
by Chang-Yi Wang. 22 Dec 64, 12p. Contract AF-AFOSR-156-64,
AFOSR 65-2471

Unclassified report

Revision of manuscript submitted 3 Oct 64.

*Availability: Published in J. Sound. Vib. v2 n3 p257-69 1965. Copies to DDC users only.*

Descriptors: (*Flow fields, Spheres), (*Spheres, Oscillation), Potential theory, Boundary layer, Fluid flow, Harmonic analysis, Reynolds number, Series, Viscosity

The method of inner and outer expansions is applied to the case of a sphere oscillating along a diameter with high Reynolds number and high Strouhal number. The entire velocity field is determined to the second order. It is found that the induced motion has a steady part, a harmonic part, and a subharmonic part. The secondary steady motion, or acoustic streaming, has a pair of toroidal cells in the boundary layer in addition to a steady streaming motion away along the axis in the outer flow field. (Author)

**AD-628 511 Fld. 20/4**
*CITY COLL OF THE CITY OF NEW YORK*
**THE EXISTENCE OF SUBSONIC JETS OF A COMPRESSIBLE FLUID,**
by I. Feinberg. Oct 64, 12p. Contract DA-30-069-ORD-2153,
AROD 247:68

Unclassified report

*Availability: Published in Communications of Pure and Applied Mathematics v18 p581-91 1965. Copies to DDC users only.*

Descriptors: (*Jets, Subsonic flow), (*Compressible flow, Boundary value problems), Fluid flow, Functions, Mathematical analysis

The report proves the existence of subsonic jets issuing from curved, symmetric channels in the plane.

**AD-628 525 Fld. 20/4, 3/2**
*NEW YORK UNIV N Y DEPT OF PHYSICS*
**CONVECTIVE INSTABILITY IN A COMPRESSIBLE ATMOSPHERE. I.**
Revised ed.,
by Edward A. Spiegel. 2 Nov 64, 24p. Contract AF-AFOSR-62-386,
AFOSR 65-2827

Unclassified report

Revision of manuscript submitted 3 Jan 64.

*Availability: Published in The Astrophysical Journal v141 n3 p1068-90 April 1, 1965. Copies to DDC users only.*

Descriptors: (*Convection (Atmospheric), Compressible flow), (*Compressible flow, Convection (Atmospheric)), Equations of state, Atmosphere, Astrophysics, Fluid mechanics

The linear equations for time-independent convection in a plane-parallel layer of perfect gas are studied for the case of constant viscosity and conductivity. These equations determine the condition for the onset of steady convection. The equations are treated from three points of view. First a perturbation expansion in terms of layer thickness is carried out to first order. The zeroth-order terms give the Boussinesq equations studied by Lord Rayleigh. The first-order terms show that if the Rayleigh number is evaluated at the mid-height of the layer, its engen values are stationary with respect to variations in layer thickness. The first-order eigenfunctions are numerically calculated for a particular polytropic index. Next, two variational statements are written and some sample numerical results are presented. It is found that variational techniques are not effective in the present problem. The WKB approach is then explored and extended to the determination of uniformly valid asymptotic solutions. These provide not only stability criteria (from which explicit numerical results are derived), but also produce analytic approximations for all the eigenmodes. This method appears to be generally useful for problems of this kind. (Author)

**AD-628 539 Fld. 20/4, 1/1**
**CFSTI Prices: HC $11.25 MF $3.00**
*FELTMAN RESEARCH LABS PICATINNY ARSENAL DOVER N J*
**SUPERSONIC FLOW ABOUT RIGHT CIRCULAR CONES AT ZERO YAW IN AIR AT THERMODYNAMIC EQUILIBRIUM. PART II. TABLES OF DATA,**
Technical memo.,
by Henry E. Hudgins,Jr.. Sep 64, 825p. Rept. no. PA-TM-1493-pt-2,
Proj. DA-1A013001A-039,

Unclassified report

See also AD-468 284.

Descriptors: (*Supersonic flow, Conical bodies), (*Tables, Aerodynamics), Chemical equilibrium, Thermodynamics, Air, Shock waves

Part I (AD-468 284) of this report is an analysis of the inviscid flow fields for air in chemical equilibrium about right circular cones at zero yaw. Parts II and III present, in tabular form, the results of the calculation of real gas supersonic flow fields about right circular cones at zero angle of yaw upon which the correlation analysis in Part I is based. The calculations were performed by a numerical integration of the conical flow equations written in terms of a single geometric parameter, the ray angle eta; thus, the results are independent of body size. Flow properties are given along rays which are defined by 10 equal angular increments between the shock and cone surface. Numerical calculations were performed utilizing the Picatinny Arsenal IBM 709/90/94 Conical Flow Field Program. Results are obtained for cone semi-angles from 2.5 degrees to 50 degrees, altitudes from 0 to 200,000 ft, and Mach numbers from 3 to 40, excluding those which result in a detached shock or are well within the ideal gas regime. (Author)

**AD-628 540 Fld. 20/4, 12/1**
**CFSTI Prices: HC $3.00 MF $0.75**
*KRAICHNAN (ROBERT H) PETERBOROUGH N H*
**ISOTROPIC TURBULENCE AND INERTIAL-RANGE STRUCTURE IN THE ABRIDGED LHDI APPROXIMATION.**
Research rept.,
by Robert H. Kraichnan. Jan 66, 89p. Rept. no. RR-8,
Contract Nonr-4307 (00) Proj. RR-009-01-01, NR-062-309

Unclassified report

Descriptors: (*Turbulence, Dynamics), (*Approximation (Mathematics), Turbulence), Statistical mechanics, Fluid mechanics, Energy, Moment of inertia, Differential geometry

The abridged LHDI (Lagrangian-History Direct Interaction) closure approximation is interpreted physically and used to analyze energy transfer, effective eddy viscosities, and Lagrangian space-time statistics in stationary and decaying isotropic turbulence. The results are then specialized to the inertial range. Numerical values are predicted for the Kolmogorov constant, the asymptotic eddy viscosities due to inertial-range wavenumbers, and the dimensionless constant in Inoue's formula for the mean-square change of Lagrangian velocity with time. Computed curves are presented for the localness of energy transfer, for Lagrangian space-time structure functions, and for Lagrangian space-time acceleration covariances. Inertial-range Eulerian spacetime structure functions also are computed. The predicted absolute Kolmogorov spectrum in the inertial and dissipation ranges is compared with data of Grant, Stewart, and Moilliet, and of M. M. Gibson. (Author)

**AD-628 541 Fld. 20/4**
**CFSTI Prices: HC $1.00 MF $0.50**
*KRAICHNAN (ROBERT H) PETERBOROUGH N H*
**DISPERSION OF PARTICLE PAIRS IN HOMOGENEOUS TURBULENCE.**
Research rept.,
by Robert H. Kraichnan. Feb 66, 25p. Rept. no. RR-9,
Contract Nonr-4307 (00) Proj. RR-009-01-01, NR062-309

Unclassified report

Descriptors: (*Turbulence, Diffusion), (*Diffusion, Turbulence), Particles, Scattering, Fluid mechanics, Numerical analysis

The relative dispersion of particle pairs in homogeneous turbulence is treated by the Lagrangian-history direct-interaction closure approximation for a conserved scalar field. Richardson's diffusion equation emerges, with the sole difference that the eddy diffusivity depends on the duration of the dispersion as well as on particle separation. The diffusivity tensor is evaluated in the inertial range, and the probability distribution for the separation distance of a particle pair is computed for long-time, inertial-range dispersion. From this solution, numerical values are obtained for the dimensionless constants in Richardson's law for mean-square separation distance and Oboukhov's scalar-field inertial-range spectrum law. An inequality relating these two constants is inferred from qualitative considerations, without use of the closure approximation. (Author)

**AD-628 542 Fld. 20/4, 12/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*KRAICHNAN (ROBERT H) PETERBOROUGH N H*
**INVARIANCE PRINCIPLES AND APPROXIMATION IN TURBULENCE DYNAMICS.**
Research rept.,
by Robert H. Kraichnan. Dec 65, 31p. Rept. no. RR-10,
Contract Nonr-4307 (00) Proj. NR-062-309
Unclassified report

Descriptors: (*Turbulence, Dynamics), (*Invariance, Dynamics), (*Approximation (Mathematics), Turbulence), Differential geometry, Statistical mechanics, Fluid mechanics, Partial differential equations

Known expansion schemes for turbulence statistical functions appear to diverge at high Reynolds numbers. The expansions are an illusory guide for choosing a closure approximation for the statistical equations. They do not provide a means either of constructing successively more accurate approximations or of estimating the error in any given approximation. In this situation, an important principle for constructing appropriate approximations is to retain as much as possible of the basic conservation, invariance, and boundedness properties of the exact flow dynamics. Approximations which preserve such properties give a hope of qualitative agreement with reality. Unless some kind of convergent and practicable kind of approximation scheme is developed, any accurate quantitative prediction from turbulence theory must be regarded as an accident or miracle. (Author)

**AD-628 543 Fld. 20/4, 9/2**
**CFSTI Prices: HC $6.60 MF $0.75**
*MICHIGAN UNIV ANN ARBOR COLL OF ENGINEERING*
**DIGITAL COMPUTER STUDIES OF CONDENSATION IN EXPANDING ONE-COMPONENT FLOWS.**
Technical rept.,
by Kenneth R. Sivier. Nov 65, 66p. Contract AF 33 (615)-2307,AF 33 (657)-8867 Proj. AF-7116, Task 711601,
ARL 65-234
Unclassified report

Descriptors: (*Condensation, Gas flow), (*Hypersonic flow, Condensation), (*Programming (Computers), Gas flow), Nitrogen, Vapors, Vapor pressure, Physical properties, Pressure, Temperature, Entropy, Nucleation, Hypersonic nozzles

The report discusses a digital computer program for calculating the vapor condensation that occurs in expanding, one-component flows. A discussion is presented of modifications made in Griffin's original program (AD-428 303). Emphasis is placed on the reasons for the modifications and their effect on the numerical results. The results of a parametric study (using the computer program) of condensation onset in nitrogen flows are presented and compared with experimental data. Several methods of presenting and correlating condensation onset data are used. One of these produces a remarkable correlation of the numerical results. The comparison between the experimental and numerical data shows that the computer program is able to reproduce satisfactorily the qualitative features of the condensation produced and to yield a relatively good quantitative picture of condensation onset in nitrogen. (Author)

**AD-628 549 Fld. 20/4**
**CFSTI Prices: HC $4.60 MF $0.50**
*CINCINNATI UNIV OHIO DEPT OF AEROSPACE ENGINEERING*
**EXPERIMENTAL DETERMINATION OF PRESSURE DISTRIBUTION OVER SLENDER CONES AT ANGLES OF ATTACK AT MACH 14.**
Scientific rept., Aug 63-May 64,
by Stuart E. Larsen, and Werner Hoelmer. Dec 65, 48p. Contract AF 33 (616)-8453, Proj. AF-7064,
ARL 65-245
Unclassified report

Descriptors: (*Conical bodies, Hypersonic flow), (*Hypersonic flow, Conical bodies), Slender bodies, Aerodynamic loading, Pressure, Distribution, Aerodynamics, Hypersonic wind tunnels, Model tests

Two slender cones, L/D = 4 and L/D = 8, were tested at a nominal Mach number of 14 in air. Total pressure and temperature conditions were 1400-1600 psia and 1350-1550F., respectively. Experimental pressure data was obtained for angles of attack between 0-20 degrees and circumferential angles of 0-180 degrees. This data is presented in conjunction with Sims' and Newtonian Impact theories. (Author)

**AD-628 568 Fld. 20/4, 14/5**
**CFSTI Prices: HC $2.00 MF $0.50**
*MASSACHUSETTS UNIV AMHERST FLUID MECHANICS LAB*
**MEASUREMENT OF LAMINAR VELOCITY PROFILES WITH NON-NEWTONIAN ADDITIVES USING PHOTOMICROSCOPY.**
Technical rept.,
by Charles E. Carver,Jr., and Richard H. Nadolink. Sep 65, 47p. Rept. no. TR-1,
Contract Nonr-3357 (07), Proj. BuShips-S-R009-01-01,
Unclassified report

Descriptors: (*Photomicroscopy, Laminar boundary layer), (*Laminar boundary layer, Photomicroscopy), Measurement, Velocity, Additives, Fluid mechanics, Test methods, Flow visualization

The report describes the development of a photomicroscopic technique, using dark field microscopy, for the direct measurement of velocity distribution in an essentially one-dimensional channel. The method is particularly adapted to velocity measurements in close proximity to a frictional boundary, of the order of five microns. Velocities are obtained from the analysis of light streaks, obtained from photomicrographs, due to the motion of illuminated polystyrene tracers, 0.55 microns in diameter, dispersed in distilled water and aqueous solutions of a number of non-Newtonian additives. Time intervals between light streak patterns were obtained by means of a specially constructed light interrupter mechanism rather than reliance upon the camera shutter speed. The photomicroscopic method was used to determine vertical velocity distributions of distilled water and aqueous solutions of the non-Newtonian additives CMC, Polyox 301 and Polyhall 27, flowing in a lucite channel 13 mm. wide and 1.5 mm in depth, at channel Reynolds numbers of 0.92. Concentrations of the additives of 1/8% and 1/4% by weight were used. The results for distilled water indicate nearly perfect agreement with the theoretical parabolic velocity distribution for flow between parallel flat plates. The additives at both concentrations showed little variation with distilled water except near the boundaries, from 0 to 100 microns, where the velocity was noticeably greater, in some cases by a factor of two. (Author)

**AD-628 578 Fld. 20/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB*
**MEASUREMENT OF VORTEX SEPARATION. PART I: TWO-DIMENSIONAL CIRCULAR AND ELLIPTIC BODIES.**
Technical rept.,
by Eric G. Friberg. Aug 65, 75p. Rept. no. TR-114,MIT-DSR-5139
Contract N600 (19)61720,
Unclassified report

Descriptors: (*Vortices, Flow separation), (*Flow separation, Cylindrical bodies), Two-dimensional flow, Flow visualization, Turbulence, Motion, Correlation techniques, Measurement

An experimental investigation of vortex separation about two-dimensional circular and elliptic cylinders using the hydrogen bubble technique for flow visualization is discussed. Data on the time-dependent motion of the separation point of the vortex feeding sheet are presented. Semi-empirical formulas are determined which correlate the time-dependent motion of the separation point as well as its position on an elliptic body of arbitrary axis ratio. Most of the data presented are for turbulent flow, but by changing the constants in the semi-empirical equations, they may be made applicable in the laminar regime as well. (Author)

**AD-628 579 Fld. 20/4, 1/3**
**CFSTI Prices: HC $11.60 MF $0.75**
*VIDYA DIV ITEK CORP PALO ALTO CALIF*
**THEORETICAL AERODYNAMICS OF FLEXIBLE WINGS AT LOW SPEEDS. V. ENGINEERING METHOD FOR ESTIMATING PARAWING PERFORMANCE.**
Final rept., Feb-Nov 65,
by Jack N. Nielsen, and Jack A. Burnell. 6 Dec 65, 111p. Rept. no. Vidya-209,
Contract Nonr-3728 (00), Proj. Vidya-9257,
Unclassified report

See also AD-617 925.

Descriptors: (*Parawings, Aerodynamic characteristics), (*Aerodynamics, Parawings), Wings, Flexible structures, Lift, Drag, Performance (Engineering), Test methods

The purpose of this report is to present engineering methods for predicting the low-speed lift and drag characteristics of parawings. Most existing data, other than that obtained under this contract for delta parawings, are for large values of canopy slackness and for the special planform extensively tested by NASA. This planform, herein termed the NASA planform, has leading edges and root chord of equal length. Theory developed under this contract was found to furnish a satisfactory basis for an engineering prediction method for the lift and drag characteristics of triangular parawings. For NASA parawings, it was found necessary to place a satisfactory engineering prediction method. Calculative examples for both types of parawings are included. The desirability of further drag measurements with special emphasis on measuring support interference effects is pointed out. (Author)

**AD-628 583 Fld. 20/4, 1/1**
**CFSTI Prices: HC $4.00 MF $0.75**
*CORNELL AERONAUTICAL LAB INC BUFFALO N Y*
**A METHOD FOR PREDICTING THE AERODYNAMIC LOADS AND DYNAMIC RESPONSE OF ROTOR BLADES.**
Final rept. Apr 64-Jul 65,
by R. A. Piziali. Jan 66, 110p. Rept. no. CAL-BB-1932-S-1,
Contract DA-44-177-AMC-163 (T), Proj. DA-1P125901A14604,
USAAVLABS TR-65-74
Unclassified report

Descriptors: (*Helicopters, Aerodynamic loading), (*Rotor blades (Rotary wings), Aerodynamic loading), (*Aerodynamic loading, Mathematical prediction), Iterative methods, Dynamics, Rotary wings, Bending, Moments, Lift, Motion, Feasibility studies

A method for predicting the aerodynamic loads and the flapwise bending moments experienced by the blades of a rotor in steady translational flight has been developed. The blade representation which is used satisfies the chordwise aerodynamic boundary condition, and a simplified dis-

crete vortex filament representation is used for the wake of each blade. An iterative procedure was developed which yields a simultaneous solution for the aerodynamic loads and dynamic response experienced by the rotor blades. The lift loadings and bending moments were computed for two flight conditions of the H-34 and HU-1A rotors. Comparisons of these results with measured results are presented as time histories and radial distributions of the harmonic components. (Author)

**AD-628 617 Fld. 20/4, 7/4**
**CFSTI Prices: HC $4.00 MF $0.75**
*CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF MECHANICAL ENGINEERING*
**UNCONVENTIONAL METHODS FOR INFLUENCING FLUID FLOW. PART IV. HIGH FIELD ELECTROPHORESIS OF SOLID SPHERICAL PARTICLES IN LOW CONDUCTIVITY LIQUIDS.**
Final rept. Oct 63-Jul 65, (Doctoral thesis),
by Simion Chaw-Yuan Kuo. Nov 65, 114p.
Contract AF 33 (657)-9914, Proj. AF-8169,
Task 816904,
AFAPL TR-64-133-Pt-4
Unclassified report

See also AD-426 989.

Descriptors: (*Electrophoresis, Spheres), (*Fluid flow, Colloids), Solids, Motion, Dielectrics, Liquids, Particles, Mathematical analysis, Mobility, Silver, Lead, Tin, Indium, Zinc, Aluminum, Glass

The use of a high electric field in low conductivity liquids to obtain high electrophoretic velocity of suspended solid particles is proposed, and its mathematical theory based on the concept of an 'electrokinetic double layer,' which is formed at the solid-liquid inteface, is examined. The mobility of a charged particle without the double layer is calculated. The retardation effect of the diffuse portion of the double layer is analyzed by considering the motion of a long thin cylindrical particle. The result is then extended to the case of a spherical particle to account for other retardation effects caused by the surface convection and conduction current. Experimental data for the mobility of Ag, Pb, Sn, In, Zn, Al and glass spheres of 100 micron radius suspended in transformer oil, and the mobility of glass and indium spheres of different radii suspended in transformer oil and its solution with additives respectively are obtained. Experimental data for the electrophoretic motion of suspensions of plexiglass particles in flowing transformer oil are also reported. (Author)

**AD-628 628 Fld. 20/4, 14/2**
**CFSTI Prices: HC $6.60 MF $0.75**
*ARO INC TULLAHOMA TENN*
**RESULTS OF AN EXPERIMENTAL INVESTIGATION OF THE PERFORMANCE OF AN EXPANSION TUBE.**
Technical rept.,
by Glenn D. Norfleet, John J. Lacey,Jr., and Jack D. Whitfield. Feb 66, 67p. Contract AF 40 (600)-1200, Proj. AF-7778, Task 777806,
AEDC TR-66-10
Unclassified report

Presented as a paper at the Hypervelocity Techniques Symposium (4th), held at Arnold Air Force Station, Tenn., 15-16 Nov 65.

Descriptors: (*Aerodynamics, Test facilities), (*Shock tubes, Hypersonic flow), (*Hypersonic flow, Variable area nozzles), (*Variable area nozzles, Hypersonic flow), Instrumentation, Fluid mechanics

The results from an experimental study of an expansion tube conducted at the von Karman Gas Dynamics Facility (VKF) are presented and discussed. The research was conducted in two facilities: (1) a 6.75-in.-diam Modified Expansion Tube (MET) which utilizes a partially steady and partially unsteady expansion process, and (2) a 4-in.-diam (constant diameter) High Density Shock Tube (HDST) operated in an expansion tube mode for a completely unsteady expansion of the shock-heated gas to the final test condition. Flow velocities from approximately 9000 to 16,000 ft/sec were studied. The theoretical performance of expansion tubes in terms of velocity is found to be nearly obtained; however, the steadiness of the resulting flow leaves much to be desired, and the definition of accurate flow conditions remains in serious doubt. (Author)

**AD-628 629 Fld. 20/4, 7/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*GENERAL ELECTRIC CO PHILADELPHIA PA MISSILE AND SPACE DIV*
**NONSIMILAR MIXING OF CHEMICALLY REACTING STREAMS.**
Technical information series,
by H. G. Lew. Jan 66, 50p. Rept. no. R66SD5,
Contract AF 04 (694)-667,
Unclassified report

For presentation at the International Heat Transfer Conference of AIAA, (3rd), Chicago, Ill., Aug 8-12, 1966.

Descriptors: (*Jet mixing flow, Chemical reactions), (*Nonequilibrium flow, Wake), Diffusion, Reentry vehicles, Atmosphere entry, Equations of motion, Laminar flow, Gas ionization, Dissociation, Mixtures, Shear layers

The study of the laminar mixing of chemically reacting streams is presented with emphasis on the nonsimilar and nonequilibrium aspect of the problem. A mixture of dissociated and ionized air species with seven components and eleven reaction models (N, O, N2, O2, NO, NO (+), e (-)) is considered. Results show the importance of nonequilibrium production of electrons in the mixing region, and that the shear layer will take many shear layer thicknesses to reach equilibrium. The numerical example shows the rapid increase of atomic species and electrons along the dividing streamline due to diffusion from the top layers. (Author)

**AD-628 630 Fld. 20/4, 13/7**
**CFSTI Prices: HC $4.00 MF $1.00**
*CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF MECHANICAL ENGINEERING*
**UNCONVENTIONAL METHODS FOR INFLUENCING FLUID FLOW. PART V. FLUID PRESSURE TRANSIENTS IN A TAPERED LINE.**
Final rept. Jun 64-Jul 65, (Doctoral thesis),
by Frank J. Tarantine. Nov 65, 137p. Contract AF 33 (657)-9914, Proj. AF-8169 Task 816904,
AFAPL TR-64-133-Pt-5
Unclassified report

See also AD-628 617.

Descriptors: (*Fluid flow, Control systems), (*Pressure, Attenuation), Taper, Liquids, Functions, Pipes, Valves, Hydraulic systems,

The study includes both an experimental and theoretical analysis of the transient wave behavior through an inviscid liquid filled, rigid tapered line subjected to both step and pulse inputs. The primary objective is to determine the applicability of a tapered line to attenuate the pressure surge associated with 'water hammer.' The analytical approach used is to divide a smoothly tapered section into a finite number of uniform lines of different characteristic impedances to form an approximation of the distributed parameter model readily solved by digital-computer computation. Three taper functions are studied in detail (linear, linear area and exponential), with two different terminations (long uniform line and reservoir). A step line is also studied, for which the method is exact. To verify the analytical approach and results, experiments were performed using water in a four step line made of copper tubing varying in diameter from 1/2 in. to 1 in. A special valve arrangement was designed to insure quick closure with minimum shock. Excellent experimental agreement was obtained. The results show that a tapered section can be used to reduce the pressure surge of 'water hammer' when the line is terminated by a reservoir. (Author)

**AD-628 676 Fld. 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*BOWLES ENGINEERING CORP SILVER SPRING MD*
**ANALYSIS AND TEST OF SIGNAL TRANSMISSION IN A MULTIPHASE FLUID MIXTURE.**
Final rept.,
by R. E. Bowles, and F. M. Manion. Jan 66, 47p.
Contract DA-44-177-AMC-202 (T) Task
1P121401A14186,
USAAVLABS TR-65-77
Unclassified report

Descriptors: (*Fluid amplifiers, Multiphase flow), (*Multiphase flow, Fluid amplifiers), Sound transmission, Two-phase flow, Gases, Liquids, Fluid mechanics

Analytic studies and experimental measurements of the velocity of sound in a two-phase mixture of gas and liquid were performed to provide a basis for analyzing performance of fluid computing networks with multiphase fluids and to stimulate the application of such conditions to fluid computation. In particular, the work was directed toward the investigation of mixtures with a large percentage of gas, a regime where little experimental data has been available. The analytic studies include a review of the classical approach to wave propagation and attenuation, which pertains to a homogeneous mixture, and a development of an analytic model consisting of layers of gas and liquid normal to the flow direction for the non-homogeneous case. Calculations based on this model show that the speed of sound and attenuation in a two-wave mixture having high gas content depend on the detailed nature of the mixture. This is borne out by the experiment. (Author)

**AD-628 683 Fld. 20/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO*
**PITOT AND STATIC PRESSURE MEASUREMENTS IN THE SEPARATED REGION OF SPIKED CYLINDER IN HYPERSONIC FLOW.**
Scientific rept.,
by William G. Reinecke, H. Harvey Album, and Thomas Johani. Nov 65, 61p. Rept. no. ARL-65-237,
Proj. AF-7064,
Unclassified report

Descriptors: (*Flow separation, Hypersonic flow), (*Hypersonic flow, Cylindrical bodies), Spikes, Pressure, Measurement, Pitot tubes

Pressure measurements were made in the region of separation induced by a sharp spike ahead of a flat faced, right circular cylinder at Mach 11.6. The pressures on the face of the cylinder were measured with both surface orifices and a traversing probe. A pitot survey was also made of the free shear layer. The results indicate that the face traversing probe did not influence the separated region greatly and gave pressure values generally in agreement with the surface orifices. The pitot probe, which was inserted farther upstream, influenced the separated region more critically, but not so much as to preclude the production of useful pitot surveys. Chapman's two-dimensional theory predicted well the maximum pressure on the model face as determined by the face traversing probe. Moreover, the tests indicated that a uniform static plateau pressure characterized the separated region. This plateau pressure was slightly Reynolds

number dependent. Thus the Chapman-Korst separation and reattachment model seems generally to cover the test configuration. A simplified analysis was made using the pitot survey of the free shear layer one body radius ahead of the model face. The results showed that the Mach number on the dividing streamline was sonic or supersonic and that the speed on the dividing streamline was from 0.4 to 0.6 of the external speed. (Author)

**AD-628 685 Fld. 20/4, 11/9**
**CFSTI Prices: HC $3.00 MF $0.75**
*UNITED STATES RUBBER CO WAYNE N J RESEARCH CENTER*
**FLOW PROPERTIES OF DILUTE SOLUTIONS OF POLYMERS. PART I. MECHANISM OF DRAG REDUCTION.**
Final rept. 1 Mar 60-30 Jun 65,
by F. W. Boggs, and J. Thompsen. Feb 66, 87p.
Contract Nonr-3120 (00) Proj. NR-062-241,
Unclassified report

Descriptors: (*Polymers, Fluid dynamic properties), (*Fluid flow, Drag), (*Drag, Inhibition), Solutions, Hydrodynamics, Additives, Stagnation point, Viscoelastacity, Laminar boundary layer, Turbulence, Stabilization, Partial differential equations

The report shows, from a theoretical discussion and analysis of experimental data, that the fractional reduction of the friction factor of a conventional liquid induced by polymeric solutes is proportional, at infinite dilution, to the 1/3 power of the Weissenberg number. It also shows that additives will not, usually, delay transition. (Author)

**AD-628 686 Fld. 20/4, 11/9**
**CFSTI Prices: HC $2.00 MF $0.50**
*UNITED STATES RUBBER CO WAYNE N J RESEARCH CENTER*
**FLOW PROPERTIES OF DILUTE SOLUTIONS OF POLYMERS. PART II. EQUIPMENT FOR DETERMINING FLOW BEHAVIOR.**
Final rept., pt 2, 1 Mar 60-30 Jun 65,
by J. Thompsen, and F. W. Boggs. Feb 66, 29p.
Contract Nonr-3120 (00) Proj. NR-062-241,
Unclassified report

See also AD-628 685.

Descriptors: (*Polymers, Fluid dynamic properties), (*Fluid flow, Test equipment), (*Test equipment, Fluid flow), Boundary layer, Flow visualization, Stereoscopic photography, Hydrostatic pressure, Hydrophones, Viscoelasticity, Pitot tubes, Equations, Drag, Inhibition, Additives

Equipment designed to study the effect of polymer additives on fluid flow is described. The objective of the equipment is the following: (1) Visual observation of the boundary layer using stereoscopic techniques. (2) Measurement, by means of a hydrophone, of the change in pressure fluctuations due to the additives. (3) Determination of the accuracy of pitot tube measurements in visoelastic fluids and (4) Determination of the material constants used in the constitutive equation studied. (Author)

**AD-628 694 Fld. 20/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*CINCINNATI UNIV OHIO HYPERSONIC AERODYNAMICS RESEARCH STAFF*
**ASYMPTOTIC METHOD OF SOLUTION OF THE FROZEN DISSOCIATED LAMINAR BOUNDARY LAYER FLOW OVER A FLAT PLATE SURFACE WITH ARBITRARILY DISTRIBUTED CATALYCITY.**
Interim technical rept., Jun 64-Jun 65,
by Ting Y. Li, and Phillip S. Kirk. Dec 65, 33p.
Contract AF 33 (616-8453, Proj. AF-7064,
ARL 65-243
Unclassified report

Descriptors: (*Laminar boundary layer, Flat plate models), Laminar flow, Dissociation, Frozen equilibrium flow, Surface properties, Numerical analysis, Fluid mechanics

Meksyn's method of solution of laminar boundary layers is extended to deal with a typical problem of a binary boundary layer with non-similar solution. The present paper deals with the asymptotic method of solution of the frozen dissociated laminar boundary layer flow over a flat plate surface with arbitrarily distributed catalycity. A closed form solution is obtained and has been compared with existing data due to other investigators. Results of the comparison show that the present results are of adequate accuracy. The attractiveness of the present method is in the simplicity of the analysis. (Author)

**AD-628 762 Fld. 20/4**
**CFSTI Prices: HC $3.60 MF $0.50**
*LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF*
**THE NEWTONIAN DIFFUSE METHOD FOR COMPUTING AERODYNAMIC FORCES,**
by W. A. Gustafson. 28 Aug 58, 33p. Rept. no. LMSD-5132,
Unclassified report

Descriptors: (*Numerical methods and procedures, Fluid mechanics), (*Aerodynamic characteristics, Bodies of revolution), Numerical analysis, Drag, Spheres, Conical bodies, Cylindrical bodies, Transport properties, Force (Mechanics), Diffusion, Theory

An investigation was made of the aerodynamic characteristics of basic shapes in rarified flows. This report contains an analysis of the drag and moment forces on spheres, conical frustums, and cylinders for arbitrary angles of attack. The analysis is based on the assumption of Newtonian flow with diffuse particle reflection. Explicit expressions are derived for quantities of interest. (Author)

**AD-628 788 Fld. 20/4**
**CFSTI Prices: HC $23.40 MF $1.25**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**NEWS OF INSTITUTIONS OF HIGHER LEARNING. AERONAUTICAL ENGINEERING (COLLECTION OF ARTICLES).**
1 Dec 65, 238p. Rept. no. FTD-MT-64-318,
TT 66-60640
Unclassified report

Edited machine trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Aviatsionnaya Tekhnika (USSR) n2 p163 1964.

Descriptors: (*Aeronautics, Reports), Fuel tanks, Rocket motors (Liquid propellants), Turbines, Jet engines, Turbojet engines, Trigonometry, Strain (Mechanics), Cylindrical bodies, Structural shells, Reinforcing materials, Spheres, Conical bodies, Gas flow, Supersonic flow, Afterburners, Flight speeds, USSR

Contents: Analysis of weight characteristics of fuel tanks of flight vehicles with liquid-propellant engines; Solution of problems of bending of three-layered plates and shells by means of a displacement function; Calculation of the nonaxially symmetric state of strain of cylindrical shells taking into account the elasticity of the reinforcing frames; Vibrations of an anisotropic plate under a continuously moving distributed load; Edge effect during the joint action of axial and radial pressure for anisotropic circular cylindrical shells; Application of the method of asymptotic integration to problems of vibrations of shells of revolution which are similar in form to spherical shells; Calculation of closed cylindrical and slightly conical shells with arbitrary contour of cross section; Experimental investigation of the propagation of fan and paired plane jets in a transverse flow; Method of supersonic analogy for calculation of one-dimensional non-stationary gas flows; Optimum compression in the compressor of a ducted-fan turbojet engine with an afterburner; Approximate method of estimating gas-dynamic influence on a supersonic flow; Influence of a sequential decrease in thickness of a metal on the curvature of shaped components; Approximate calculation of speed of flight in a slanted dive and determination of loss in altitude and range on the dive entry section on a program for a pilotless aircraft with turbojet engine.

**AD-628 811 Fld. 20/4**
**CFSTI Prices: HC $2.60 MF $0.50**
*JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MECHANICS*
**ON THE FLOW OF AN OSEEN-LIKE FLUID PAST A PARABOLIC CYLINDER,**
by Carl Kaplan. Jan 66, 21p. Contract AF 49 (638)-496,
AFOSR 66-0001
Unclassified report

Descriptors: (*Cylindrical bodies, Fluid flow), (*Fluid flow, Cylindrical bodies), Partial differential equations, Equations of motion, Operators (Mathematics), Axially symmetric flow, Drag

The Navier-Stokes equations for two-dimensional flow are linearized around a dominant uniform stream velocity. The resulting linearized Oseen equations are then regarded as the exact equations of flow of the model fluid. The concept of field modes in fluid mechanics is summarized and then applied to the problem of flow over a parabolic cylinder fixed in an unbounded uniform stream. (Author)

**AD-628 066 See Fld. 7/4**

**AD-628 111 See Fld. 22/3**

**AD-628 179 See Fld. 20/9**

**AD-628 181 See Fld. 20/9**

**AD-628 268 See Fld. 20/9**

**AD-628 293 See Fld. 20/10**

**AD-628 467 See Fld. 20/9**

**AD-628 547 See Fld. 20/13**

**AD-628 555 See Fld. 13/10**

**AD-628 729 See Fld. 20/9**

**AD-628 867 See Fld. 13/13**

## 20/5. MASERS AND LASERS

**AD-628 046 Fld. 20/5, 20/6, 9/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*TEXAS INSTRUMENTS INC DALLAS APPARATUS RESEARCH AND DEVELOPMENT LAB*
**LARGE-ANGLE DEFLECTION TECHNIQUES FOR LASER DISPLAY.**
Quarterly rept. no. 2, 19 Aug-19 Nov 65,
by G. R. Fournier, and H. W. Parker. Jan 66,
32p. Rept. no. U2-912008-2,
Contract AF 30 (602)-3731, Proj. AF-5577,
RADC TR-65-465
Unclassified report

Descriptors: (*Lasers, Display systems), (*Scanning, Display systems), Deflection, Electrooptics, Fiber optics, Television display systems, Piezoelectric transducers

Work has continued on a large-angle deflection technique for producing a 945 line TV type raster scan in an experimental laser display. A 14 degree scan angle was achieved at 28,350 cycles by the horizontal deflector comprised of a piezoelectric cartridge and mirror coupled by a glass resonator

shaft. Cartridges made of PZT-4 material as well as silica fibers are being investigated in an attempt to improve the scanners. Tests to determine angular and lateral deflection, effects of cooling, and mechanical resonant frequencies were performed, and an electrical equivalent circuit was arrived at. Electronic drive circuitry for both horizontal and vertical scanners was further developed. It was concluded that at least twenty-five factors and variables contribute to the characteristics of the scanners. Other type scanners were also investigated. (Author)

**AD-628 076 Fld. 20/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*MICROWAVE LAB STANFORD UNIV CALIF*
**ENERGY TRANSFER IN SOLID LASER MATERIALS.**
Technical summary rept. no. 6, 1 Aug-31 Oct 65. Dec 65, 6p. Rept. no. ML-1393, Contract Nonr-225 (78) ,ARPA Order-306-64

Unclassified report

Descriptors: (*Lasers, Materials), (*Electron transitions, Lasers), Excitation, Ultraviolet radiation, Masers, Ruby

Methods are studied of exciting solid materials for visible, and possibly ultraviolet, maser action, and of energy transfer processes between energy levels and between ions. (Author)

**AD-628 253 Fld. 20/5**
*TRG INC MELVILLE N Y*
**LASER TECHNOLOGY,**
by Richard T. Daly. 1964, 5p. Contract AF 49 (638)-673 ,AF 49 (638)-1535 AFOSR 65-2969

Unclassified report

*Availability: Published in EDN p120-23, 199 1965. Copies to DDC users only.*

Descriptors: (*Lasers, Scientific research), Gases, Plasma medium, Semiconductors, Liquids

The technology of gaseous laser oscillators, homogeneous solid or liquid phase lasers, and junction or semiconductor lasers is discussed.

**AD-628 295 Fld. 20/5, 13/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*AIR FORCE WEAPONS LAB KIRTLAND AFB N MEX*
**ANGULAR DEPENDENCE OF SURFACE SCATTERED LASER RADIATION.**
Rept. for 15 Nov-10 Dec 65, by Ronald L. Grotbeck, and Glenn Doughty. Jan 66, 27p. Rept. no. afwl-TR-65-220, Contract order-313-62, Proj. AF-8814,

Unclassified report

Descriptors: (*Lasers, Light), (*Heat shields, Optical properties), Electromagnetic waves, Scattering, Intensity, Surface properties

Experiments to determine the relative intensity of light scattered at various angles from several materials were performed. Various target materials were mounted on an optical bench and illuminated by a Spectra Physics 116 gas laser. The targets were rotated through various angles with respect to the optical bench, and the distance between the detector and target was varied to record a constant voltage reading on a 555 oscilloscope. Different graphs showing isointensity lines for various angles of incidence as well as graphs showing the percent of intensity reflected as a function of distance were then plotted. (Author)

**AD-628 469 Fld. 20/5, 20/6**
*LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS*
**COHERENCE EFFECTS IN GASEOUS LASERS WITH AXIAL MAGNETIC FIELDS. II. EXPERIMENTAL.**
Revised ed.,
by J. Kannelaud, and W. Culshaw. 15 Jul 65, 9p.

Unclassified report

Revision of manuscript received 15 Feb 65.

*Availability: Published in Physical Review v141 n1 p237-45 Jan 1966. Copies to DDC users only.*

Descriptors: (*Lasers, Gases), (*Magneto-optic effect, Lasers), Magnetic fields, Polarization, Electron transitions, Helium, Neon, Cavity resonators

The rotation of the plane of polarization with an axial magnetic field on a short single-mode He-Ne planar-tube aser has been studied experimentally. The study is concerned with regions of magnetic field where the beat frequency between the orthogonal circularly polarized oscillations approaches zero. A mutual synchronization of these otherwise independent oscillations then occurs over a range of magnetic field, resulting in a single frequency of oscillation in which the polarization remains linear but rotates. In near-zero magnetic field, rotations up to 1/4 pi are observed and may occur with magnetic fields less than 0.1 G. Results are given on the rotation versus magnetic field as a function of the laser intensity, the cavity tuning within the Doppler linewidth, the total gas pressure, and the anisotropy in the cavity losses. The observed rotation increases with the intensity and decreases with cavity detuning, with increasing total gas pressure, and with increasing anisotropy in the cavity Q. On attaining a rotation of 1/4 pi, a transition region of magnetic field between the linear and circularly polarized regions is observed. The beat signal from the orthogonal circularly polarized waves then shows a high harmonic content due to transient behavior, which gives way to a single beat as the magnetic field is increased. Coherence regions are observed at magnetic fields of 10 G or more, where the observed beat frequency again approaches zero. The polarization again becomes linear and rotations similar to those in near-zero magnetic field are observed. (Author)

**AD-628 470 Fld. 20/5, 20/6**
*LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS*
**COHERENCE EFFECTS IN GASEOUS LASERS WITH AXIAL MAGNETIC FIELDS. I. THEORETICAL.**
Revised ed.,
by W. Culshaw, and J. Kannelaud. 15 Jul 65, 9p.

Unclassified report

Revision of manuscript received 30 Nov 64.

*Availability: Published in Physical Review v141 n1 p228-36 Jan 1966. Copies to DDC users only.*

Descriptors: (*Lasers, Gases), (*Magneto-optic effect, Lasers), Magnetic fields, Polarization, Electron transitions, Helium, Neon, Cavity resonators

The Lamb theory of the optical maser is applied to circularly polarized atomic transitions, and used to consider the beat frequencies and the coherence properties of such orthogonal fields when axial magnetic fields are applied to the gaseous laser. The beat frequency approaches zero in near-zero magnetic fields and synchronization can then occur between the right- and left-handed circularly polarized oscillations. For a resonator with no undue polarization constraint, such a strong coupling gives rise to a linearly polarized output, and to a rotation of the plane of polarization with increasing magnetic field. A self-consistent expression is derived for this rotation under steady-state conditions, and a maximum rotation of plus or minus 1/4 pi with magnetic field is indicated before the synchronization breaks down and circularly polarized beat phenomena appear. The rotation with magnetic field depends on the laser intensity, on the anisotropy in the cavity losses, and on the position of the cavity resonance within the Doppler linewidth. Also, the angle of rotation is indeterminate unless such anisotropy is present. Other regions of such coherence can occur at higher magnetic fields, where the beat frequency again approaches zero. These depend on the detailed shape of the various dispersion curves of the laser medium. The results derived from the theory used are in general agreement with experimental observations on the 1.153-micron He-Ne laser transition. (Author)

**AD-628 489 Fld. 20/5**
**CFSTI Prices: HC $3.60 MF $0.50**
*WESTINGHOUSE ELECTRIC CORP BALTIMORE MD*
**THERMAL OPTIC DISTORTION.**
Semi-Annual rept. no. 1, 16 Jun-16 Dec 65, by J. H. Cullom, E. P. Riedel, and G. D. Baldwin. 16 Dec 65, 40p. Rept. no. MDE-6236, Contract Nonr-4874 (00),ARPA Order-306 Proj. 4730,

Unclassified report

Descriptors: (*Lasers, Degradation), (*Neodynium, Lasers), (*Glass, Lasers), Rods, Doping, Optical properties, Distortion, Theory, Thermal properties, Pumping (Optical)

Preliminary measurements were made on a 3/8 x 3inch neodymium-doped Kodak glass laser rod. The measurements performed were space and time resolved measurements of pump induced bi-refringence during and after the pump phase. The theoretical portion of the investigation completed covers a preliminary analysis of the pump induced birefringence. Two clad neodymium doped laser rods, and one undoped glass 'control' rod, were ordered from the American Optical Company. (Author)

**AD-628 526 Fld. 20/5, 7/5**
**CFSTI Prices: HC $2.60 MF $0.50**
*GENERAL PRECISION INC LITTLE FALLS N J AEROSPACE GROUP*
**LIQUID LASER PARAMETERS.**
Semiannual technical rept., 1 Aug 65-31 Jan 66, by Harvey Forest, Daniel Grafstein, and Aryeh H. Samuel. 28 Feb 66, 28p. Contract Nonr-4644 (00) ,ARPA Order-306-62

Unclassified report

Descriptors: (*Lasers, Materials), (*Rare earth compounds, Lasers), (*Complex compounds, Lasers), (*Eurpium compounds, Lasers), Organic phosphorus compounds, Excitation, Electron transitions, Fluorescence, Samaruim compounds, Neodymium compounds, Praseodymium compounds, Terbium compounds, Chlorides, Organic nitrogen compounds, Amides, Phosphates

Studies were made of europium complexes of hexamethyl phosphoramide triethyl phosphate, and tri-n-butyl phosphate, which are promising direct-excitation liquid laser materials. An overall quantum efficiency of 0.5 for fluorescence was measured. It was found that complex formation is essentially complete when the Eu concentration is below 0.2 M even when hydrated Eu salts are used. The excess of 5D0 states required for laser action was calculated. A laser threshold of 6.3 watts/cu cm per Angstrom interval of the absorption band is calculated on the basis of these data for a 0.02 M europium complex in a 5 cm tube. Additional compounds prepared include: triethyl phosphate complexes of SmCl3, NdCl3, PrCl3, and TbCl3, which resemble the EuCl3 complexes; also EuCl3 complexes with triphenyl phosphate, urea, thiourea, dimethyl sulfoxide, dimethyl formamide, dimethyl acetamide, and tetramethylurea. Fluorescence in the complexes having C=O and S=O ligands is enhanced over that in aqueous Eu solutions, but not as much as in P=O complexes. The formation of precipitates from heated EuCl3

- alkyl phosphate complexes was further studied and a formula for the precipitate is proposed.

**AD-628 560 Fld. 20/5, 20/12**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**PRESSURE-TUNED PBSE DIODE LASER,**
by J. M. Besson, J. F. Butler, A. R. Calawa, W. Paul, and R. H. Rediker. 6 Aug 65, 4p. Rept. no. JA-2636.
Contract AF 19(628)-5167.
ESD TDR-65-583

Unclassified report

Prepared in cooperation with Harvard Univ., Cambridge, Mass. Contracts Nonr-1866(10), SD-88.

*Availability: Published in Applied Physics Letters, v7 n8 p206-8 Oct 15 1965. Copies to DDC users only.*

Descriptors: (*Lasers, Diodes (Semiconductor)), Lead alloys, Selenium alloys, Hydrostatic pressure, Refractive index

Coherent and spontaneous emission from PbSe diode lasers was studied as a function of hydrostatic pressure up to 7.1 kilobars. The diffused p-n junction diodes were mounted in a pressure vessel equipped with IRTRAN II windows. The vessel was immersed in liquid nitrogen. The emission wavelength was tuned from approximately 7.4 microns to 11.4 microns. A value of -0.0000085 eV/bar was obtained for the pressure coefficient of the spontaneous emission peak. Cavity modes shifted at a rate corresponding to a relative variation of refractive index (1/n) (dn/dP) of about 0.000013/bar. There was no significant change of emission intensity with pressure. (Author)

**AD-628 607 Fld. 20/5**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J*
**OPTICAL MISALIGNMENT DUE TO TEMPERATURE GRADIENTS IN ELECTROOPTIC MODULATOR CRYSTALS,**
by Clarie Loscoe, and Herbert Mette. 8 Apr 65. 4p.

Unclassified report

*Availability: Published in Applied Optics, v5 n1 p93-6 Jan 1966. Copies to DDC users only.*

Descriptors: (*Electrooptics, Modulators), (*Modulators, Misalignment), (*Thermal properties, Modulators), Lasers, Crystals, Light communication systems, Index of refraction, Thermal expansion, Quartz

A possible source of misalignment of light in an optical communication system, utilizing electrooptic modulators, is the deflection of the light beam within the modulator crystal due to temperature gradients. The present paper investigates the light deflection resulting from a linear temperature gradient across various modulator crystals. The total effect is found to be the sum of two contributions, one due to the crystal expansion, the other due to the index of refraction gradient, and is found to be smaller, by the factor 10, in quartz than in KDP. The experimental method described provides also a simple way of determining dn/dT in crystals for both ordinary and extraordinary rays. Author)

**AD-628 705 Fld. 20/5**
*MASSACHUSETTS INST OF TECH CAMBRIDGE LAB FOR INSULATION RESEARCH*
**EFFECTS OF OUTPUT COUPLING ON OPTICAL MASERS.**
Revised ed.,
by P. A. Miles, and I. Goldstein. 26 Apr 63, 5p.
Contract AF-AFOSR-62-317.
AFOSR 65-2873

Unclassified report

Revision of manuscript submitted 15 Jan 63.

*Availability: Published in IEEE Transactions of the Professional Technical Group on Electron Devices vED-10 n5 p314-8 Sep 1963. Copies to DDC users only.*

Descriptors: (*Lasers, Excitation), Electron transitions, Absorption, Oscillation, Ruby

Effects of output coupling on the threshold and power output of optical masers have been considered. The application of this theory to the ruby optical maser indicates high internal losses under strong excitation conditions. (Author)

**AD-628 044 See Fld. 20/6**

**AD-628 074 See Fld. 20/6**

**AD-628 200 See Fld. 20/14**

**AD-628 588 See Fld. 17/8**

## 20/6. OPTICS

**AD-628 044 Fld. 20/6, 20/8, 20/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*ADVANCED KINETICS INC COSTA MESA CALIF*
**STUDIES ON THE INTERACTION OF LIGHT AND PARTICLE BEAMS.**
Technical status rept., 1 Feb-1 Aug 65,
by Ralph W. Waniek. 1 Sep 65, 16p. Contract AF 49(638)-1359. Proj. AF-9768. Task 976802. AFOSR 65-2276

Unclassified report

See also AD-614 790 and AD-619 134.

Descriptors: (*Particle beams, Light), (*Light, Particle beams), Magneto-optic effect, Lasers, Magnetic fields, Acceleration, Velocity, Vaporization

The effect of localized evaporation induced in minute particles by an impinging beam of coherent radiation was calculated. The expected recoil velocities as generated by the beam pressure compounded by the evaporation process were determined and the acceleration of the macroscopic particles was evaluated for a given duration of the vaporization process. The Faraday effect at optical frequencies was investigated in magnetic fields up to 400,000 oersteds. The investigation has resulted in the determination of the Verdet coefficients for 10 optical media at lambda = 6328A. The experiment was conducted by means of a DC excited helium-neon laser operated in a hemispherical configuration and with transient magnetic fields provided by a 10 kilojoule bank. This investigation has established the practicality of optical rotators and switches of modest dimensions, low absorption, wide wavelength coverage extending into the far infrared.

**AD-628 074 Fld. 20/6, 20/5**
**CFSTI Prices: HC $1.00 MF $0.50**
*CALIFORNIA UNIV BERKELEY DEPT OF PHYSICS*
**BEAM DETEORIATION AND STIMULATED RAMAN EFFECT,**
by Y. R. Shen, and Y. J. Shaham. 1965. 8p. Contract Nonr-3656(32).

Unclassified report

Descriptors: (*Lasers, Optical properties), (*Raman spectroscopy, Lasers), Light, Scattering, Degradation

Experimental evidence is presented to suggest that scattering mechanicsms in a medium can produce inhomogeneities or filamentary structure in an initially homogeneous laser beam. It is these hot filaments which are responsible for the many anomalous effects previously observed.

**AD-628 133 Fld. 20/6, 9/1**
**CFSTI Prices: HC $8.60 MF $0.75**
*STROMBERG-CARLSON CORP SAN DIEGO CALIF*
**RANDOM ACCESS LIGHT VALVE STUDY.**
Final rept.,
by O. F. Hamann. Jan 66, 87p. Rept. no. sc-9991012.
Contract AF 30(602)-3646. Proj. AF-5597. Task 559702.
RADC TR-65-451

Unclassified report

Descriptors: (*Display systems, Cathode ray tubes), (*Electron optics, Cathode ray tubes), (*Cathode ray tubes, Display system), (*Electrooptics, Display systems), Optical equipment, Oils, Films, Surface properties, Schlieren photography, Viewing screens

The purpose of this study was to determine the feasibility of producing a random scan light valve by using a cathode-ray tube with a wire mosaic faceplate to transfer the charge pattern on the inside of the tube to the outside where it would interact with a thin fluid film and thereby cause a change in the surface flatness of this film. In this study program, the variations in the surface flatness were viewed with a Schlieren optical system which projected a bright image of the variations in the surface flatness to a viewing screen. A breadboarded model of a recommended system was constructed and its performance was analyzed. Test results indicated that a full-size system based on this principle is feasible and will provide the desired characteristics of brightness, resolution, and random scan. (Author)

**AD-628 134 Fld. 20/6**
**CFSTI Prices: HC $3.00 MF $0.75**
*BLOCK ENGINEERING INC CAMBRIDGE MASS*
**MEASUREMENTS IN THE FAR INFRARED.**
Final rept. 1 Apr 62-30 Sep 65,
by Amos Engelstrath. Dec 65, 79p. Contract AF 19(628)-484. Proj. AF-7670,AF-8603 Task 767003,860301
AFCRL 65-905

Unclassified report

Descriptors: (*Infrared spectroscopy, Quartz), (*Quartz, Infrared spectroscopy), (*Interferometers, Infrared equipment), (*Infrared equipment, Interferometers), Infrared detectors, Dielectrics, Optics, Bolometers

This work consists of two independent parts. Part one deals with the optical and dispersion constants of quartz in the infrared and discussion of a general method of finding optical of dielectrics from two reflection measurements of plane polarized light. A discussion of the pro and con of this method is included and the error in the optical constants found. Part two deals with the construction and operation of a Michelson interferometer. This part includes the operation and properties of cooled bolometers used with the interferometer. (Author)

**AD-628 332 Fld. 20/6**
**CFSTI Prices: HC $1.00 MF $0.50**
*HOLMAN (JOHN F) CO INC WASHINGTON D C*
**DETERMINATION OF SIGHTING ERRORS THROUGH VARIATION OF COLOR AND FORM OF THE SIGHTING MARKS,**
by H. Klappstein. Feb 66, 10p. Contract DA-44-009-AMC-930(T) Proj. DA-4-A-623-501-A-852.
TT 66-60586, AERDL T-1817-66

Unclassified report

Trans. of Vermessungstechnik (East Germany) v12 n12 p471-2 1964.

Descriptors: (*Theodolites, Calibration), Human engineering, Instrumentation, Surveying, Errors, East Germany

The study is concerned with the sighting error of optical theodolites in conjunction with sighting disks in polygonometry. The sighting error is a measure for the uncertainty in pointing the line of sight of a sighting telescope on a target. It is the summary expression for the conjoined action of its four components: (1) error of the observer, (2) error of the instrument, (3) error of the medium, and (4) error of the target. Results of the investigation of the four Sighting-Error Components are presented.

**AD-628 355 Fld. 20/6, 9/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*POLYTECHNIC INST OF BROOKLYN N Y MICROWAVE RESEARCH INST*
**RAY THEORY OF OPTICAL RESONATORS AND BEAM WAVEGUIDES.**
Research rept.,
by Walter K. Kahn. Jul 65, 40p. Rept. no. PIB-MRI-1285-65,
Contract AF 49 (638)-1402,
Unclassified report

Descriptors: (*Optics, Resonators), (*Resonators, Optics), (*Waveguides, Optics), Matrix algebra, Theory

Important characteristics of optical resonators and beam waveguides can be inferred from simple ray -optical considerations. The ray theory is susceptible of an extremely convenient algebraic formulation from which formal analogs in terms of electrical networks are evident. In laser applications of optical resonators the medium is certainly inhomogeneous and dispersive. A ray analysis is carried through for a resonator containing an inhomogeneous medium, and yields some very interesting general conclusions. The stability of the ray systems within the resonator, i.e., high and low loss configurations are discussed in terms of a generalization of Pierce's criterion. It is shown that the law for the variation of the spot size within an (empty) optical resonator of the generalized confocal type may be deduced from geometric optical considerations. The variation is identified with the envelope of a system of rays within the resonator. When a resonator is filled with a convergent inhomogeneous medium, stable and unstable (high and low loss) configurations are shown to recur periodically with mirror separation. (Author)

**AD-628 394 Fld. 20/6, 20/12**
**CFSTI Prices: HC $2.00 MF $0.50**
*NEW YORK UNIV N Y RADIATION AND SOLID STATE LAB*
**LUMINESCENCE, INFRARED RESPONSE AND ENERGY STORAGE OF VARIOUS LUMINESCENT MATERIALS IN RELATION TO PREPARATIVE METHODS AND CONDITIONS.**
Final rept., 1 Oct 64-31 Jan 65,
by Hartmut P. Kallmann. Dec 65, 41p. Contract DA-ARO (D)-31-124-G420,
Unclassified report

Descriptors: (*Luminescence, Phosphorescent materials), (*Infrared radiation, Luminescence), (*Photoelectric effect, Voltage), Quenching (Inhibition), Photoconductivity, Band theory of solids, Zinc compounds, Sulfides, Crystal structure

Contents: Trapping and infrared response of a 'bluegreen' ZnS phosphor; Photovoltaic effects observed with thin films of zinc sulfide; Infrared quenching of luminescence in ZnS phosphors.

**AD-628 473 Fld. 20/6**
*GENERAL DYNAMICS/ASTRONAUTICS SAN DIEGO CALIF SPACE SCIENCE LAB*
**UNIFIED REFRACTIVE INDEX AND DISPERSION EQUATIONS,**
by M. L. Streiff, and C. C. Ferriso. 24 May 65, 3p.
Unclassified report

Sponsored by ARPA through ONR.

*Availability: Published in Applied Optics v4 n12 p1668-9 Dec 1965. Copies to DDC users only.*

Descriptors: (*Refractive index, Equations), Scattering, Optical properties

A table is given of constants of the refractive index and dispersion equations for various prism materials.

**AD-628 493 Fld. 20/6**
**CFSTI Prices: HC $2.60 MF $0.50**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**RESONANCE SCATTERING OF LYMAN-ALPHA RADIATION BY HYDROGEN IN THE GROUND STATE,**
Technical note,
by Harry E. Moses. 4 Feb 66, 21p. Rept. no. TN-1966-14,
Contract AF 19 (628)-5167 ,ARPA Order-600
ESD TDR-66-32
Unclassified report

Descriptors: (*Photons, Resonance scattering), (*Hydrogen, Resonance scattering), (*Resonance scattering, Probability), Operators (Mathematics), Quantum statistics, Frequency, Line spectrum, Atomic energy levels

Consideration is given to the problem of the scattering of a photon by hydrogen in the ground state when the photon has its principal frequencies near that of Lyman-alpha radiation. The scattering operator and cross-section is obtained for this process. The procedure is to adapt Dirac's theory of resonance scattering to the problem and, by quantizing the electromagnetic field in an angular momentum basis, to solve the problem exactly within the framework of the Dirac theory. The total scattering cross-section at resonance is found to be 7.062 x 10 to the -12th power sq. cm. The natural half width of the scattered line is 0.000103 A. The resonance frequency itself is shifted toward the long wave length side by 4281 mc/sec. The shift in the resonance from the original Lyman-alpha frequency can be interpreted as an indication that the Dirac resonance scattering theory contains a large part of the Lamb shift of the ground state. This fact suggests new ways of obtaining the Lamb shift for various levels which will be explored later. (Author)

**AD-628 563 Fld. 20/6**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**SELF-FOCUSING OF OPTICAL BEAMS,**
by Paul L. Kelley. 21 Oct 65, 5p. Rept. no. JA-2684,
Contract AF 19 (628)-5167,
ESD TDR-66-29
Unclassified report

*Availability: Published in Physical Review Letters v15 n26 p1005-8 27 Dec 1965. Copies to DDC users only.*

Descriptors: (*Light, Focusing), (*Optical phenomena, Focusing), (*Focusing, Automatic), Refractive index, Liquids, Scattering, Nonlinear systems

The self-focusing of optical beams due to a nonlinear increase in refractive index is studied. The relavent parameters determining the focusing distance are found. The self-focusing explains the anomalous gain observed in some liquids for the stimulated Raman effect. (Author)

**AD-628 647 Fld. 20/6, 14/2**
*COURANT INST OF MATHEMATICAL SCIENCES NEW YORK UNIV N Y*
**SEMI-INFINITE DIFFRACTION GRATINGS. II. INWARD RESONANCE.**
Scientific rept.,
by Norman L. Hills. Jun 64, 10p. Rept. no. EL-8,
Contract Nonr-285 (48), Proj. NR-371-146,
Unclassified report

*Availability: Published in Communications on Pure and Applied Mathematics, v18 p389-95 1965. Copies to DDC users only.*

Descriptors: (*Diffraction gratings, Resonance), Cylindrical bodies, Wave functions, Approximation (Mathematics)

This paper is a continuation of S. Karp, and N. Hull's: Semi-Infinite Diffraction Gratings I (AD-617 220), in which an explicit solution is given for diffraction of a plane wave by a semi-infinite grating of small conducting cylinders. The previously omitted anomalous case of inward resonance in which a diffracted wave travels parallel to and into the grating is treated here. A number of novel features show up, among which is the fact that the 'Kirchoff' solution (the solution which treats each cylinder as though it were embedded in an infinite grating) fails completely at inward resonance, although it gave resonable results in most respects in the nonresonant case and at outward resonance. (Author)

**AD-628 657 Fld. 20/6, 20/13, 7/4**
*VIRGINIA UNIV CHARLOTTESVILLE DEPT OF PHYSICS*
**RECOMBINATION LUMINESCENCE IN THE SCINTILLATION OF NORMAL AND SUPERFLUID LIQUID HELIUM,**
by Frank L. Hereford, and Frank E. Moss. 9 Aug 65, 5p. Contract DA-ARO (D)-31-124-G744, AROD 4685:3
Unclassified report

*Availability: Published in The Physical Review, v141 n1 p204-8 Jan 1966. Copies to DDC users only.*

Descriptors: (*Scintillation, Helium), (*Helium, Liquefied gases), (*Luminescence, Recombination reactions), Alpha bombardment, Ionic current, Superfluidity

The alpha-particle-induced scintillation of liquid helium has been studied experimentally in the temperature range 1.23 to 4.2K with an electric field (9 to 43 kV/cm) applied in the region of the alpha tracks. Simultaneously with observation of the scintillation intensity, the ion current extracted from the alpha tracks by the field was measured. The results indicate that recombination luminescence accounts for approximately 60% of the total scintillation intensity (with zero electric field) and that this component of the intensity is temperature-independent. However, the ion current extracted by the field and the corresponding reduction in scintillation intensity both have temperature dependences which exhibit anomalous behavior in the He II region. (Author)

**AD-628 745 Fld. 20/6, 7/4**
*POMONA COLL CLAREMONT CALIF*
**SOME NOTES ON ULTRASOFT X-RAY FLUORESCENCE ANALYSIS, 10 TO 100 A REGION,**
by Burton L. Henke. 1965, 16p. Contract AF-AFOSR-62-415,
AFOSR 65-2825
Unclassified report

*Availability: Published in Advances in X-Ray Analysis, v8 p269-84 1965. Copies to DDC users only.*

Descriptors: (*X-ray spectroscopy, Instrumentation), Fluorescence, Vacuum apparatus, Spectrum analyzers, Focusing, X-ray tubes, Absorption, Magnesium, Sodium, Fluorine, Oxygen, Nitrogen, Carbon, Boron, Beryllium

Methods and instrumentation were developed for the extension of X-ray fluorescence analysis into the light element region, magnesium through beryllium. Examples of current values for the minimum detectable limits for these elements and associated instrumental parameters are presented. Some specific techniques are described for the use of an ultrasoft X-ray vacuum spectrograph, for the development of large d-spacing multilayer analyzers, and for the construction of thin window systems. (Author)

**AD-628 759 Fld. 20/6, 7/2, 6/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX*
**AN IMPROVED FLAME SPECTROPHOTOMETER FOR BIOLOGIC CALCIUM ANALYSIS.**
Rept. for 4 Dec 63-15 Apr 64,
by Charles C. Bittle, Theodore N. Lynch, and William T. Harrell. Feb 66, 14p. Rept. no. SAM-TR-66-6,
Proj. AF-7755,
Unclassified report

Descriptors: (*Spectrophotometers, Biochemistry), (*Calcium, Volumetric analysis), Determination, Solution, Blood serum, Urine, Excretion, Chemical analysis

A flame spectrophotometry system is presented which determines the calcium content of solutions to an accuracy of plus or minus 1%. This accuracy is obtained by modifying the Beckman model DU flame spectrophotometer to improve its sensitivity and stability. The modifications include (a) the substitution of acetylene for oxygen as the spraying gas, (b) introduction of a mechanism for adjusting the wavelength selector in small increments, (c) redesign of the photomultiplier circuit to provide an increased current amplification with a wider range of control, and (d) addition of a wide-scale, sensitive galvanometer for the purpose of prerecording monitoring. The entire system has been used successfully for more than a year to determine serum, urine, and stool calcium of human subjects. (Author)

**AD-628 861 Fld. 20/6, 20/2**
**CFSTI Prices: HC $3.00 MF $0.75**
*NEW YORK UNIV N Y DEPT OF PHYSICS*
**SOLID STATE RADIATION-INDUCED PHENOMENA.**
Final rept., 1 Mar-Sep 65,
by Hartmut Kallmann. Jan 66, 78p. Contract DA-36-039-sc-90689, Proj. DA-1A0-10505-B010-00,
Unclassified report

Descriptors: (*Optical phenomena, Crystals), (*Crystals, Solid state physics), Zinc compounds, Sulfides, Cadmium compounds, Luminescence, Photoconductivity, Phosphorescent materials, Infrared radiation, Ultraviolet radiation, Solutions, Organic solvents, Excitation, Single crystals, Electrical impedance

The relationship between fluorescence, fluorescence quenching, light stimulation, glow areas, and the photoinduced EPR signals in excited Cr, Cu activated ZnS phosphors was studied. Two types of trap levels exist: deep traps due to chromium and shallow traps located in the neighborhood of ionized Cu activators; their trap populations are determined. AC impedance measurements on photo-excited CdS single crystals mounted between insulating layers was carried out. The use of insulating layers eliminates electron and hole injection and allows one to study the motion of the electrons inside the crystals separately. The transfer of excitation energy in organic solvents was investigated as function of temperature. It is reduced with increasing temperature. This is, to a large part, due to the decrease of the lifetime of the excited solvent molecule. The charge injection from unexcited inorganic layers into various organic solvents under illumination, and the charge exchange between organic solvents and crystals was studied. (Author)

**AD-628 046** **See Fld. 20/5**

**AD-628 122** **See Fld. 20/12**

**AD-628 229** **See Fld. 7/4**

**AD-628 333** **See Fld. 6/16**

**AD-628 407** **See Fld. 7/4**

**AD-628 427** **See Fld. 7/4**

**AD-628 453** **See Fld. 20/12**

**AD-628 469** **See Fld. 20/5**

**AD-628 470** **See Fld. 20/5**

**AD-628 503** **See Fld. 11/9**

**AD-628 519** **See Fld. 20/12**

**AD-628 557** **See Fld. 3/2**

**AD-628 724** **See Fld. 7/5**

**AD-628 874** **See Fld. 4/1**

## 20/7. PARTICLE ACCELERATORS

**AD-628 872** **See Fld. 20/8**

## 20/8. PARTICLE PHYSICS

**AD-628 077 Fld. 20/8**
**CFSTI Prices: HC $1.00 MF $0.50**
*CALIFORNIA UNIV LOS ANGELES DEPT OF PHYSICS*
**DELAYED ALPHA PARTICLES FROM NA20.**
Technical rept.,
by R. M. Polichar. Dec 65, 16p. Rept. no. P-73
Contract Nonr-233 (44),
Unclassified report

Summary of a contributed paper to Meeting of APS, December 21, 1965.

Descriptors: (*Alpha decay, Sodium), Decay schemes, Neon, Beta decay, Alpha spectra, Mass number

Measurement of the energy spectrum of delayed alpha particles emitted from excited states of Ne20 following the beta decay of Na20. Activity is produced by Mg24 (p, alpha n)Na20 reaction with 45 Mev protons. Lines have been observed corresponding to alpha transitions from the 7.43, 10.28 and 12.13 MeV levels of Ne20. Some evidence for other transitions is present in spectrum. (Author)

**AD-628 119 Fld. 20/8**
**CFSTI Prices: HC $4.00 MF $0.75**
*CARNEGIE INST OF TECH PITTSBURGH PA*
**STRUCTURE EFFECTS IN THE CHARGE RADIUS OF SPHERICAL NUCLEI.**
Technical rept.,
by Richard A. Uher, and Raymond A. Sorensen.
Feb 66, 101p. Rept. no. TR-22,
Contract Nonr-760 (15) Proj. NR-024-439,
Unclassified report

Descriptors: (*Nuclear structure, Charged particles), Nuclear models, Isomeric transitions, Nuclear energy levels, Polarization, Isotopes, Nucleons, Wave functions

Isotope and isomer shifts of the nuclear charge radius are calculated using the pairing plus quadrupole model. To accomplish this, the nuclear system is divided into a core plus a few valence particles. Monopole polarization of the core by the particles is taken into account in a phenomenological manner by assuming that the particles interact independently with the core. Quadrupole polarization of the core by the particles is estimated with the help of an effective quadrupole charge determined by fitting BE2 transition rates of even-A nuclei. The independent particle configuration of the valence nucleons is admixed by the pairing plus quadrupole interaction and the resulting wave functions are used to calculate isotope and isomer shifts of the charge radius. The results of even-A to even-A isotope shifts show good agreement with experiment, while the odd-even staggering effects observed in the isotope shift cannot be obtained. Good agreement is obtained for the few isomer shifts which have been measured. (Author)

**AD-628 252 Fld. 20/8**
*BELFER GRADUATE SCHOOL OF SCIENCE YESHIVA UNIV NEW YORK*
**MICROSCOPIC THEORY OF BROWNIAN MOTION IN AN OSCILLATING FIELD; CONNECTION WITH MACROSCOPIC THEORY,**
by J. L. Lebowitz, and P. Resibois. 24 Mar 65, 11p. Contract AF-AFOSR-508-64,
AFOSR 65-2865
Unclassified report

Prepared in cooperation with Brussels Univ. (Belgium).

*Availability: Published in The Physical Review, v139 n4A pA1101-11 Aug 16 1965. Copies to DDC users only.*

Descriptors: (*Brownian motion, Theory), Electric fields, Oscillation, Distribution functions, Kinetic theory, Hydrodynamics, Particles, Belgium

Recently, Lebowitz and Rubin, and Resibois and Davis, showed that the Fokker-Planck equation for the distribution function of a Brownian particle (B particle) of mass M, in a fluid of particles of mass m, may be derived directly from the Liouville equation for the joint distribution of fluid and B particle. It is the lowest order term in a (m/M) to the 1/2 power expansion of the effect of the fluid on the distribution of the B particle. These authors studied in particular the steady-state distribution function of B particles acted on by a small constant external field E, which results from a balance between the effects of the driving force and those of the fluid. These studies are now extended to the case where the B particle is acted on by a time-dependent field. Complete agreement is had between the microscopic theory and that obtained from stochastic considerations. The relation between the different formalisms used by Lebowitz and Rubin and by Resibois and Davis are also clarified. (Author)

**AD-628 267 Fld. 20/8**
*YALE UNIV NEW HAVEN CONN*
**EFFECT OF FINITE LIFE OF UPPER LEVEL ON PROBABILITY OF COULOMB EXCITATION,**
by G. Breit, and R. L. Gluckstern. 4 Jun 60, 15p.
Contract AF 18 (600)-771 ,AT (30-1)-1807
AFOSR TN-60-615
Unclassified report

*Availability: Published in Nuclear Physics v20 n2 p188-201 1960. Copies to DDC users only.*

Descriptors: (*Nuclear energy levels, Excitation), (*Excitation, Probability), Approximation (Mathematics), Hamiltonian, Nuclear reactions, Nuclear resonance, Relativity theory

The effect of the finite life of the upper level on the probability of Coulomb excitation is calculated in the semiclassical approximation. The problem is first treated by considering the upper level to be coupled to the continuum by means of a matrix element as in the Weisskopi-Wigner treatment of emission and absorption in radiation theory. Equa-



211-792 O-66-7

tions for the excitation probability at intermediate times are worked out. The overall transition probability from the ground state to the continuum is transformed in terms of an integral over energies for a transition to a level with infinite life time. The result is then interpreted and generalized in terms of direct transitions to the continuum of stationary states without making use of the division of the nuclear Hamiltonian into parts which provided the matrix element of the first treatment. The second approximation provides a more accurate formula for the overall transition probability and relates the Coulomb excitation probability directly to the Einstein absorption probabilities per unit frequency range. A schematic illustration is given for the increase in the number of transitions from the ground state. (Author)

**AD-628 288 Fld. 20/8, 20/10**
*HARVARD UNIV CAMBRIDGE MASS*
**REGGE POLES IN QUANTUM ELECTRODYNAMICS WITH MASSIVE PHOTONS,**
by Hung Cheng, and Tai Tsun Wu. 14 Jun 65, 5p. Contract AF 49 (638)-1380, AFOSR 65-2792

Unclassified report

*Availability: Published in The Physical Review, v140 n2B pB465-9 Oct 25 1965. Copies to DDC users only.*

Descriptors: (*Field theory, Photons), (*Photons, Compton scattering), Quantum mechanics, Perturbation theory, Complex variables, Fermions

Starting from the Lagrangian theory of quantum electrodynamics with massive photons, it is found that the lowest order radiative corrections to the fourth order 'box' diagram of the Compton scattering amplitude contribute terms proportional to (lnt)-sq for large t, violating the Regge behavior if uncanceled. The sixth-order ladder diagram and two others obtained from it by interchanging one of the external photon vertices with a virtual photon vertex are re-evaluated. It is found that the unwanted terms contributed by all these diagrams exactly cancel, proving that in this theory, the fermion lies on a Regge trajectory, up to the sixth-order perturbation. (Author)

**AD-628 339 Fld. 20/8**
*TRINITY COLL DUBLIN (EIRE) SCHOOL OF MATHEMATICS*
**METHODS AND RESULTS OF A GENERAL THEORY OF PARTICLES WITH SPIN AND ITS CONNECTION WITH SU12,**
by L. Castell. 26 Mar 65, 2p. Contract AF-EOAR-61-64, AFOSR 65-2953

Unclassified report

*Availability: Published in Zeitschrift fur Naturforsehung, v20 p737-8 1965. Copies to DDC users only.*

Descriptors: (*Elementary particles, Nuclear spins), Field theory, Quantum mechanics

**AD-628 341 Fld. 20/8**
*TRINITY COLL DUBLIN (EIRE) SCHOOL OF MATHEMATICS*
**SU (12) MASS FORMULA,**
by L. Castell. 18 Mar 65, 4p. Contract AF-EOAR-61-64, AFOSR 65-2870

Unclassified report

*Availability: Published in Physical Review Letters, v14 n18 p753-4 May 3 1965. Copies to DDC users only.*

Descriptors: (*Elementary particles, Field theory), Quantum mechanics, Algebra, Nuclear spins

**AD-628 342 Fld. 20/8**
*IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS*
**A FIELD-THEORETIC PROOF OF A MODIFIED VERSION OF LEVINSON'S THEOREM,**
by J. M. Charap. 17 Aug 64, 19p. Contract AF-EOAR-46-64, AFOSR 65-2958

Unclassified report

*Availability: Published in Il Nuovo Cimento (Ser10) v36 p419-35 Mar 16 1965. Copies to DDC users only.*

Descriptors: (*Field theory, Elementary particles), Potential theory, Nuclear scattering, Phase shift, Wave functions, Integral equations

A consideration of the integral equation for the vertex function derived from field theory leads to a proof of a new form of Levinson's theorem. The number of CDD poles, which occur at first-sheet zeros of the vertex function, must be supplemented by the number of second-sheet zeros of the vertex function, at which points occur the poles of the amplitude associated with particles for which the wave-function renormalization constant vanishes. (Author)

**AD-628 373 Fld. 20/8**
*BRUSSELS UNIV (BELGIUM)*
**TRANSPORT EQUATION OF A BROWNIAN PARTICLE IN AN EXTERNAL FIELD,**
by H. T. Davis, and P. Resibois. 12 May 63, 17p. Contract AF-EOAR-62-16, AFOSR 65-2877

Unclassified report

*Availability: Published in Physica, v30 p1077-91 1964. Copies to DDC users only.*

Descriptors: (*Brownian motion, Transport properties), (*Charged particles, Equations of motion), Electric fields, Statistical mechanics, N-body problem, Perturbation theory

The general theory of irreversible processes developed by I. Prigogine and coworkers is applied to the particular problem of the motion of a heavy charged particle (mass M) moving in a fluid of light particles under the influence of an external electric field. The results obtained recently by J. Lebowitz and E. Rubin are recovered using a completely different technique: to the lowest order in gamma the Brownian particle obeys a FokkerPlanck equation. The higher order corrections are also discussed and special attention is focused on the effect of the field during a collision process between the Brownian particle and the fluid: this effect can, however, be incorporated in a velocity dependent correction to the Fokker-Planck collision term. (Author)

**AD-628 374 Fld. 20/8**
*BRUSSELS UNIV (BELGIUM)*
**KINETIC EQUATIONS AND STATIONARY STATE FOR A SYSTEM IN A UNIFORM EXTERNAL FIELD,**
by G. Severne. 25 Oct 63, 26p. Contract AF-EOAR-62-16, Proj. AF-9767, Task 976701, AFOSR 65-2881

Unclassified report

*Availability: Published in Physica, v30 p1365-88 1964. Copies to DDC users only.*

Descriptors: (*Equations of motion, N-body problem), (*Statistical mechanics, Field theory), Green's function, Statics, Plasma medium, Electric fields

In an extension of the formalism developed by I. Prigogine and his collaborators, the generalized equations of evolution are derived for a system in the presence of an external field, of arbitrary strength and time dependence, but uniform in space. The basic new feature of both the non-Markoffian and the asymptotic equations consists in the field dependence of the collision term. The explicit form of these field corrections is worked out for a simplified description of a plasma in a constant electric field, and the limit of validity of the usual kinetic equations is specified. The generalized equation of evolution introduces a corrective term linear in the electric field which, for the stationary state, is precisely such as to ensure the complete equivalence with the linear response function formulation of the stationary state, i.e. with the Kubo formula. (Author)

**AD-628 375 Fld. 20/8, 20/2**
*TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF PHYSICS*
**PROPER FUNCTIONS FOR A BLOCH ELECTRON IN A MAGNETIC FIELD,**
by J. Zak. 2 Mar 65, 4p. Contract AF-EOAR-25-65, AFOSR 65-2554

Unclassified report

*Availability: Published in The Physical Review, v139 n4A pA1159-62 Aug 16 1965. Copies to DDC users only.*

Descriptors: (*Electrons, Wave functions), (*Magnetic fields, Crystal lattices), Quantum mechanics, Energy, Relativity theory

Functions are defined as products of a properly symmetrized function for a free electron in a magnetic field and of a Bloch-type function. An equation is derived for the Bloch-type function, and it is shown that in general the energy for a Bloch electron in a magnetic field is obtained by superimposing Landau levels on the energy spectrum of the crystal. The treatment is based on the symmetry of the equation for a Bloch electron in magnetic field. (Author)

**AD-628 436 Fld. 20/8**
*CALIFORNIA UNIV LA JOLLA DEPT OF PHYSICS*
**ENERGY GAP IN A CUBICAL MODEL FOR NUCLEI,**
by C. J. Thompson. 12 Dec 64, 7p. Contract AF-AFOSR-610-64, Proj. AF-9761, Task 976101, AFOSR 65-2542

Unclassified report

*Availability: Published in Physics Letters, v14 n2 p146-9 Jan 15 1965. Copies to DDC users only.*

Descriptors: (*Nuclear models, Nuclear energy levels), Potential theory, Nucleons

**AD-628 461 Fld. 20/8**
*CALIFORNIA INST OF TECH PASADENA*
**EXCHANGE AND OVERLAP EFFECTS IN ELECTRON CAPTURE RATIOS: PHYSICAL BASIS AND EXPERIMENTAL TESTS,**
by John N. Bahcall. 2 Apr 65, 7p. Contract Nonr-220 (47), NGR-05-002-028

Unclassified report

*Availability: Published in Nuclear Physics, v71 n2 p267-72 1965. Copies to DDC users only.*

Descriptors: (*Electron capture, Atomic energy levels), Wave functions, Probability

The physical basis for exchange and overlap corrections in electron capture processes is discussed. A number of experimental comparisons and predictions are presented. (Author)

**AD-628 650 Fld. 20/8**
*SLOANE PHYSICS LAB YALE UNIV NEW HAVEN CONN*
**INFLUENCE OF MULTIPLE VIRTUAL TRANSITIONS ON THE REORIENTATION EFFECT IN COULOMB EXCITATION,**

by J. F. Masso, and D. L. Lin. 28 Jul 65, 9p. Contract DA-ARO (D)-31-124-G607, Proj. 893-P
AROD 893:106

Unclassified report

*Availability: Published in Physical Review v140 n5B pB1182-90 Dec 6 1965. Copies to DDC users only.*

Descriptors: (*Electric fields, Excitation), (*Nuclear energy levels, Excitation), (*Excitation, Nuclear energy levels), Ion bombardment, Nuclear scattering, Even-even nuclei, Perturbation theory

Calculations of the reorientation effect in Coulomb excitation of the first 2 (+) state of even-even nuclei are extended by employing the semiclassical approximation to take into account second- and third-order virtual E2 transitions to higher excited states. Deviations from first-order perturbation theory in the excitation probability are investigated numerically as a function of the bombarding energy and the scattering angle for heavy-ion projectiles. Results are presented for rotational and vibrational nuclei as a guide in the selection of conditions suitable for the determination of the static quadrupole moment of the lowest 2 (+) state. Conditions for the practical convergence of the perturbation expansion are discussed. (Author)

**AD-628 698 Fld. 20/8**
*SAO PAULO UNIV (BRAZIL)*
**THE EP = 2.66 MEV RESONANCE IN 016 (P,P)016,**
by V. Gomes, R. A. Douglas, T. Polga, and O. Sala. 26 Oct 64, 10p. Contract AF-AFOSR-310-63, Proj. AF-9751 Task 975102, AFOSR 65-2695

Unclassified report

*Availability: Published in Nuclear Physics, v68 p417-25 1965. Copies to DDC users only.*

Descriptors: (*Proton scattering, Oxygen), (*Nuclear resonance, Proton scattering), Elastic scattering, Differential cross section

The absolute differential cross section has been measured over the Ep = 2.66 MeV resonance (E (x) (F17) = 3.10 MeV) in O16 (p,p)O16 at the following angles in the centre-of-mass system: 54.5 deg., 70.5 deg., 90.0 deg., 107.0 deg., 125.5 deg., 140.5 deg. and 151.3 deg. Also angular distributions (15 angles from 0 (c.m.) = 30.5 deg. to 155.6 deg.) were measured at the following energies: 1.473, 1.931, 2.481, 2.652, 2.660, 2.668 and 2.978 MeV. A partial wave analysis of the results was performed. The first analysis used only cross section data as the input to the computer programme. The results fail to predict the observed off resonance polarizations. A second analysis using both cross section and polarization data for the input gives a satisfactory fit to all experimental data. (Author)

**AD-628 812 Fld. 20/8**
**CFSTI Prices: HC $2.60 MF $0.50**
*PITTSBURGH UNIV PA*
**APPLICATIONS OF MODERN DEVELOPMENTS IN SCATTERING THEORY TO ATOMIC COLLISION PROBLEMS.**
Summary rept. 1 Mar 65-28 Feb 66,
by Edward Gerjuoy. 28 Feb 66, 29p. Contract Nonr-624 (16) Proj. NR-012-119,

Unclassified report

Descriptors: (*Atoms, Scattering), N-body problem, Electrons, Hydrogen, Integrals

The Faddeev-Lovelace formulation of three-body collision problems is applied to the specific problem of e-H scattering. The Faddeev-Lovelace procedures for e-H scattering are described, but numerical results are not obtained, because the integrals which appear are difficult. These integrals involve the complex momenta of the interacting particles, and are derived making use of the known exact analytic dependence (on the complex momenta of the interacting particles) of the two-body Coulomb scattering amplitude, given previously.

**AD-628 824 Fld. 20/8**
*WASHINGTON UNIV SEATTLE*
**INTERNAL CONVERSION IN FE57 FROM THE MOSSBAUER EFFECT IN IRON,**
by R. M. Housley, and R. H. Nussbaum. 8 Dec 64, 11p. Contract AF-AFOSR-594-64, AFOSR 65-2571

Unclassified report

Prepared in cooperation with Portland State Coll., Oregon.

*Availability: Published in Nuclear Physics v68 p145-52 1965. Copies to DDC users only.*

Descriptors: (*Iron, Internal conversion), (*Internal conversion, Iron), (*Mossbauer effect, Iron), Foils, Nuclear resonance, Nuclear cross sections, Magnetic fields, Nuclear reactions, Gamma rays, Nuclear energy levels, Line spectrum

The conversion coefficient of the 14.4 keV Mossbauer transition in Fe (57) was determined from the effective nuclear resonance cross section of a thin natural iron foil placed in a saturating magnetic field. Near natural line widths were obtained with a single line source with precisely known resonant fraction. The total conversion coefficient of 9.0 plus or minus 0.4 is in agreement with recent values from nuclear spectroscopy. (Author)

**AD-628 825 Fld. 20/8**
*WASHINGTON UNIV SEATTLE*
**MEAN-SQUARE NUCLEAR DISPLACEMENT OF FE57 IN ZN FROM THE MOSSBAUER EFFECT,**
by R. M. Housley, and R. H. Nussbaum. 14 Dec 64, 4p. Contract AF-AFOSR-594-64, AFOSR 65-2597

Unclassified report

Prepared in cooperation with Portland State Coll., Oreg.

*Availability: Published in Physical Review v138 n3A pA753-4 May 3 1965. Copies to DDC users only.*

Descriptors: (*Iron, Nuclear moments), (*Zinc, Nuclear moments), Mossbauer effect, Isotopes, Doping, Single crystals, Impurities

Fe57 in Zn shows a quadrupole splitting of 0.53 plus or minus 0.03 mm/sec and a chemical shift of -0.53 plus or minus 0.02 mm/sec relative to an Fe metal absorber at room temperature. The measurements of the Mossbauer fraction f indicate a ratio of mean-square displacements (x squared) parallel/ (x squared) perpendicular > or = 2 at room temperature relative to the crystal c axis. This is in qualitative agreement with lattice-dynamical calculations. (Author)

**AD-628 872 Fld. 20/8, 20/7**
**CFSTI Prices: HC $1.00 MF $0.50**
*BARTOL RESEARCH FOUNDATION FRANKLIN INST SWARTHMORE PA*
**ANNUAL PROGRESS REPORT FOR 1965.**
2 Mar 66, 22p. Contract Nonr-3777 (00) Proj. NR-024-021,

Unclassified report

See also AD-612 192.

Descriptors: (*Nuclear physics, Scientific research), (*Cosmic rays, Atmosphere), Nuclear resonance, Fluorescence, Excitation, Nuclei, Nitrogen, Sodium, Sulfur, Gamma rays, Nuclear scattering, Nuclear isobars, Van de Graff generators, Nuclear energy levels, Neutrons

The experimental nuclear physics program concentrated on the application of the resonance fluorescence method to the measurement of the properties of excited states of nuclei, and on preparations for a modification of the Bartol-ONR Van de Graff which will make it possible to switch from protons to electrons without the need to open the machine. The theoretical investigations were concerned with the isobaric splitting of nuclear dipole states and with the properties of odd-parity states in Y90 and Zr90. Studies of the variation of the intensity of the nucleonic component of the cosmic radiation as a function of altitude and geographic position have continued with the cooperation of the U. S. Naval Oceanographic Office. Data are now available for making a detailed comparison of similar observations conducted at solar maximum and solar minimum. In addition, the primary objectives of the neutron multiplicity experiments have been achieved during the past year. (Author)

**AD-628 876 Fld. 20/8**
*CALIFORNIA INST OF TECH PASADENA*
**POLARIZATION OF THE RECOIL PROTON FROM PI (0) 0 PHOTOPRODUCTION IN HYDROGEN.**
Revised ed.,
by J. O. Maloy, V. Z. Peterson, J. I. Friedman, H. Kendall, and G. A. Salandin. 19 Apr 65, 14p. Contract Nonr-225 (67) Proj. NR-022-026,

Unclassified report

Revision of manuscript submitted 18 May 64. Prepared in cooperation with High Energy Physics Lab., Stanford Univ., Calif., Rept. no. HEPL-426.

*Availability: Published in Physical Review v139 n3B pB733-46 Aug 9 1965. Copies to DDC users only.*

Descriptors: (*Photonuclear reactions, Hydrogen), (*Hydrogen, Photonuclear reactions), Protons, Polarization, Pions, Nuclear resonance, Photons, Nuclear scattering, Colloids, Proton beams, Elastic scattering

The polarization of the recoil proton in neutral singlepion photoproduction from hydrogen, was measured for pion center-of-mass angles near 90 degrees at 7 photon energies from 450 to 900 MeV. The polarization rises to a maximum of 0.58 near 600 MeV and is still 0.42 at 900 MeV. The sign of the polarization is negative in the sense of kXq, where k is the photon momentum and q is the pion momentum. The measured values are given as functions of laboratory photon energy and c.m. pion angle as follows: 450 MeV, 109 degrees, -0.16 plus or minus 0.14; 525 MeV, 84 degrees, -0.36 plus or minus 0.19; 585 MeV, 86 degrees, -0.58 plus or minus 0.15; 660 MeV, 77 degrees, -0.51 plus or minus 0.17; 755 MeV, 76 degrees, -0.55 plus or minus 0.15; 810 MeV, 89 degrees, -0.45 plus or minus 0.17; 895 MeV, 90 degrees, -0.42 plus or minus 0.16. The recoil protons were momentumanalyzed with a magnetic spectrometer. Nuclear emulsion was used as scatterer and detector. The emulsion technique is discussed in detail. The number of individual scatterings in emulsion used for each measurement varied between 750 and 1000. (Author)

**AD-628 878 Fld. 20/8**
*BARTOL RESEARCH FOUNDATION FRANKLIN INST SWARTHMORE PA*
**ISOBARIC SPLITTING OF DIPOLE STATES IN NUCLEI,**
by S. Fallieros, B. Goulard, and R. H. Venter. 14 Oct 65, 3p. Contract Nonr-3777 (00),

Unclassified report

*Availability: Published in Physics Letters v19 n5 p398-400 15 Nov 1965. Copies to DDC users only.*

Descriptors: (*Nuclei, Nuclear isobars), Excitation, Nuclear energy levels

The relation between two familiar modes of nuclear excitation, the dipole modes on the one hand and the analog excitations on the other, is studied in this note. It is clear that a relation exists since some dipole states are also analogs and vice versa. That some reconciliation is also needed is suggested by the fact that the conventional methods describing such states are not identical.

**AD-628 879 Fld. 20/8, 18/8, 7/4**
*BARTOL RESEARCH FOUNDATION FRANKLIN INST SWARTHMORE PA*
**LIFETIME OF THE 6.880-MEV LEVEL OF Si28,**
by C. P. Swann. 9 Mar 65, 3p. Contract Nonr-3777 (00),
Unclassified report

*Availability: Published in Physical Review, v139 n2B pB271-3 Jul 26 1965. Copies to DDC users only.*

Descriptors: (*Silicon, Nuclear energy levels), (*Nuclear energy levels, Silicon), Resonance absorption, Nuclear spins, Radioactive decay, Resonance scattering

**AD-628 880 Fld. 20/8, 18/8, 7/4**
*BARTOL RESEARCH FOUNDATION FRANKLIN INST SWARTHMORE PA*
**MEAN LIFE OF THE 2.98-MEV LEVEL OF A147,**
by N. A. Khan, and V. K. Rasmussen. 1 Feb 65, 6p. Contract Nonr-3777 (00),
Unclassified report

*Availability: Published in Physical Review, v138 n6B pB1385-90 June 21 1965. Copies to DDC users only.*

Descriptors: (*Aluminum, Nuclear energy levels), (*Nuclear energy levels, Aluminum), Resonance scattering, Nuclear spins, Radioactive decay, Resonance absorption

**AD-628 881 Fld. 20/8, 18/8, 7/4**
*BARTOL RESEARCH FOUNDATION FRANKLIN INST SWARTHMORE PA*
**PROPERTIES OF THE 4.403-MEV EXCITED STATE OF A127,**
by F. R. Metzger. 3 May 65, 4p. Contract Nonr-3777 (00),
Unclassified report

*Availability: Published in Physical Review, v139 n6B pB1464-7 Sep 20 1965. Copies to DDC users only.*

Descriptors: (*Aluminum, Nuclear properties), (*Nuclear properties, Aluminum), Nuclear energy levels, Nuclear spins, Excitation, Resonance scattering

**AD-628 882 Fld. 20/8, 18/8**
*BARTOL RESEARCH FOUNDATION FRANKLIN INST SWARTHMORE PA*
**PROPERTIES OF THE STATE IN P31 AT 7.14 MEV,**
by P. F. Hinrichsen, and C. P. Swann. 30 Jun 65, 6p. Contract Nonr-3777 (00),
Unclassified report

*Availability: Published in Physical Review, v140 n3B pB549-54 Nov 8 1965. Copies to DDC users only.*

Descriptors: (*Phosphorus, Nuclear properties), (*Nuclear properties, Phosphorus), Resonance scattering, Fluorescence, Resonance absorption, Gamma rays

**AD-628 044** **See Fld. 20/6**

**AD-628 255** **See Fld. 4/1**

**AD-628 256** **See Fld. 20/10**

**AD-628 409** **See Fld. 20/10**

**AD-628 459** **See Fld. 3/2**

**AD-628 460** **See Fld. 3/2**

**AD-628 631** **See Fld. 4/1**

**AD-628 656** **See Fld. 7/4**

**AD-628 724** **See Fld. 7/5**

**AD-628 739** **See Fld. 20/10**

**AD-628 834** **See Fld. 20/10**

## 20/9. PLASMA PHYSICS

**AD-628 061 Fld. 20/9**
*TECHNION - ISRAEL INST OF TECH HAIFA*
**MAGNETOGASDYNAMIC HYPERCRITICAL FLOWS WITH SHOCKS,**
by Nima Geffen. 18 Jan 65, 8p. Contract AF-EOAR-78-64,
AFOSR 65-2493
Unclassified report

Proceedings of Israel Annual Conference on Aviation and Astronautics (7th) Feb 1965.

*Availability: Published in Israel Journal of Technology v3 n1 p82-7 1965. Copies to DDC users only.*

Descriptors: (*Magnetohydrodynamics, Shock waves), Plasma medium, Transonic flow, Slender bodies, Israel

Steady, aligned-fields non-disscipative magnetogasdynamic flows around slender bodies are investigated in the hypercritical (near A-sq + M-sq = 1) approximation. The mathematical system is similar to the transonic one, and can be obtained from the latter by a simple transformation. The flow patterns however, include near-horizontal upstream facing shocks, and are different from ordinary gasdynamic flows. The methods used and a few of the flow patterns obtained are described in the paper. (Author)

**AD-628 065 Fld. 20/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*GENERAL ELECTRIC CO PHILADELPHIA PA MISSILE AND SPACE DIV*
**EXTRA THERMAL IONIZATION AND MHD FLOWS.**
Final rept.,
by Arthur Sherman. 15 Oct 65, 5p. Contract AF 49 (638)-1465,
AFOSR 65-2237
Unclassified report

Descriptors: (*Magnetohydrodynamics, Ionization), (*Ionization, Magnetohydrodynamics), Fluid flow, Crossed field devices, Electrical conductance

Investigation is described of the interaction between extra-thermal ionization and MHD flows. The motivation for such research has been related research (experimental) into crossed field devices utilizing extra-thermal ionization to enhance electrical conductivity. (Author)

**AD-628 143 Fld. 20/9, 22/3**
**CFSTI Prices: HC $1.10 MF $0.50**
*ROCHESTER UNIV N Y DEPT OF MECHANICAL AND AEROSPACE SCIENCES*
**ELECTRON AND ION DENSITY AHEAD OF AIR SHOCK WAVES.**
Final rept., 1 Oct 64-30 Nov 65,
by Helmut D. Weymann. 18 Jan 66, 4p. Contract AF-AFOSR-478-65, Proj. AF-9783, Task 978302,
AFOSR 66-0169
Unclassified report

Descriptors: (*Shock waves, Plasma medium), (*Plasma sheath, Atmosphere entry), Electron density, Ionization, Argon, Shock tubes

Electron and ion density measurements ahead of strong shock waves are described. Measurements were made with a new collecting probe in a pressure driven shock tube with argon on the experimental gas. For initial pressures of 5 mmHg and Mach numbers of about 10 plasma density profiles were measured up to 150 cm ahead of the shock. (Author)

**AD-628 179 Fld. 20/9, 12/1, 20/4**
**CFSTI Prices: HC $1.10 MF $0.50**
*WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL) DEPT OF APPLIED MATHEMATICS*
**THE NUMERICAL INTEGRATION OF THE EQUATIONS OF MOTION OF A VISCOUS FLUID, PART 1.**
Final rept.,
by J. Gillis, and A. Brandt. 25 Aug 65, 5p. Contract AF-EOAR-73-63, Proj. AF-9749, Task 974901,
AFOSR 65-2213-Pt-1
Unclassified report

See also AD-614 915.

Descriptors: (*Integration, Equations of motion), (*Equations of motion, Integration), (*Magnetohydrodynamics, Equations of motion), Partial differential equations, Viscosity, Fluid mechanics, Numerical analysis, Israel

A brief review is given of work on the development of methods for solving the equations of motion of magnetohydrodynamics, taking account of viscous effects. The case of an electrically conductive fluid in an external transverse magnetic field is investigated. When the external field is zero, the equations reduce to those of Navier-Stokes. Several checks to the accuracy of the solutions are considered. (Author)

**AD-628 180 Fld. 20/9**
**CFSTI Prices: HC $4.60 MF $0.50**
*WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL) DEPT OF APPLIED MATHEMATICS*
**MAGNETOHYDRODYNAMIC FLOW IN THE INLET REGION OF A STRAIGHT CHANNEL.**
Final rept.,
by A. Brandt, and J. Gillis. 25 Aug 65, 42p. Contract AF-EOAR-75-63, Proj. AF 9749, Task 974901,
AFOSR 65-2213-Pt-2
Unclassified report

Descriptors: (*Magnetohydrodynamics, Equations of motion), Reynolds number, Viscosity, Two-dimensional flow, Magnetic fields, Fluid flow, Israel

A brief review is given of work on the development of methods for solving the equations of motion of magnetohydrodynamics, taking account of viscous effects. The case of an electrically conductive fluid in an external transverse magnetic field is investigated. When the external field is zero, the equations reduce to those of Navier-Stokes. Several checks to the accuracy of the solutions are considered. For the above problem, the complete equations are solved numerically without any approximating assumptions, and the velocity profiles, magnetic lines of force, and pressure distribution are calculated. Comparison of the results to other studies are made in the limiting case of large Reynolds number. The steady state flow is considered with or without the magnetic field. Special attention is given to the rate of approach of the flow to the Hartmann-Poiseuille patterns downstream. In general the approach to the limiting pattern is exponential. The exponents are

found to fall into two classes, one depending chiefly on the Reynolds number and Hartmann number, and the other on the magnetic Reynolds number and Hartmann number. (Author)

**AD-628 181 Fld. 20/9, 12/1, 20/4**
**CFSTI Prices: HC $2.60 MF $0.50**
*WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL) DEPT OF APPLIED MATHEMATICS*
**ASYMPTOTIC APPROACH TO HARTMANN-POISEUILLE FLOWS.**
Final rept., pt. 3,
by J. Gillis, and A. Brandt. 25 Aug 65, 28p. Contract AF-EOAR-73-63,
AFOSR 65-2213-Pt-3

Unclassified report

Descriptors: (*Magnetohydrodynamics, Equations of motion), (*Equations of motion, Integration), (*Asymptotic series, Fluid mechanics), Numerical analysis, Viscosity, Israel

The steady state flow is considered with or without the magnetic field. Special attention is given to the rate of approach of the flow to the Hartmann-Poiseuille patterns downstream. In general the approach to the limiting pattern is exponential. The exponents are found to fall into two classes, one depending chiefly on the Reynolds number and Hartmann number, and the other on the magnetic Reynolds number and Hartmann number. (Author)

**AD-628 186 Fld. 20/9**
**CFSTI Prices: HC $7.60 MF $0.75**
*ILLINOIS UNIV URBANA AERONOMY LAB*
**THE ADMITTANCE AND RESONANCE PROBE CHARACTERISTICS OF A SPHERICAL PLASMA PROBE.**
Scientific rept. no. 2, Feb-Sep 65,
by Richard J. Kostelnicek. Nov 65, 76p. Rept. no. aeronomy-8,
Contract AF 19 (628)-3900, Proj. AF-5710,
AFCRL 65-858

Unclassified report

Descriptors: (*Plasma medium, Langmuir probes), (*Langmuir probes, Plasma medium), Resonance, Admittance, Plasma oscillations, Plasma sheath, Voltage, Discharge tubes, Electron density

A formula for the admittance of a spherical probe in a warm collisional plasma is derived. The equations for the perturbations in sheath voltage and number density at the plasma-sheath interface are related to the resonance probe phenomenon. Laboratory measurements of the resonance probe and admittance characteristics were found to agree fairly well with the theoretical calculations. (Author)

**AD-628 187 Fld. 20/9**
**CFSTI Prices: HC $3.60 MF $0.50**
*ATOMICS INTERNATIONAL CANOGA PARK CALIF*
**FLOWING GAS DISCHARGES IN POTASSIUM AND MERCURY.**
Final rept., Apr 64-May 65,
by Charles A. Guderjahn. 1 Jul 65, 38p. Rept. no. AI-65-120,
Contract AF 49 (638)-1222, Proj. AF-9752,
Task 975201,
AFOSR 65-1914

Unclassified report

Descriptors: (*Magnetohydrodynamics, Plasma medium), (*Potassium, Electrical resistance), (*Mercury, Electrical resistance), (*Gas discharges, Plasma medium), Vapors, Fluid flow, Electrons, Atoms, Probability, Gas ionization, Magnetic fields, Inductance

The resistivity of superheated potassium and mercury vapor was measured. Substantial heating of the gas by the discharge was avoided by flowing the gas through the discharge region. The resistivity of potassium gas at 7.8 torr pressure, 870K and 1 amp/sq. cm. current is 2.2 ohm-cm. The resistivity of mercury gas at 14 torr pressure, 870K and 0.67 amp/sq. cm. current is 10 ohm-cm. The resistance was primarily due to short range electron-neutral atom collisions. The cross section for this process as calculated from the resistivity is 1.5 x 10 to the -14th power sq. cm. for potassium and 2.5 x 10 to the -14th power sq. cm. for mercury. Radiation losses were neglected in this calculation. An experimental MGD device using potassium as a working fluid was constructed. Ionization was to be nonequilibrium and provided by magnetic induction. Selfsubstained operation was not achieved due to internal shorting by potassium films on insulator surfaces. (Author)

**AD-628 268 Fld. 20/9, 20/4, 14/2**
**CFSTI Prices: HC $9.60 MF $0.75**
*ELECTRO-OPTICAL SYSTEMS INC PASADENA CALIF*
**BASIC RESEARCH ON GAS FLOWS THROUGH ELECTRIC ARCS. PHASE III. STUDIES OF THE INLET REGION.**
Final scientific rept.,
by G. L. Marlotte, and P. D. Lenn. Nov 65, 96p.
Contract AF 33 (657)-7940, Proj. AF-7063
Task 706303,
ARL 65-231

Unclassified report

Descriptors: (*Plasma medium, Gas flow), (*Gas discharges, Gas flow), (*Gas flow, Electric arcs), (*Electric arcs, Gas flow), (*Arc heaters, Gas flow), Heating, Theory, Nitrogen, Argon, Hydrogen, Statistical analysis, Thermodynamics, Thermal radiation, Spectroscopy

Experimental and theoretical investigations dealing with interaction phenomena in the inlet or gas heating region of a segmented water-cooled constricted are reported. A simple arc column theory including radiation is considerably refined to yield comprehensive scaling parameters for both the fully developed and the inlet regions of the arc. Extensive measurement on nitrogen, argon and hydrogen in both regions are listed and compared in detail with various aspects of the scaling theory. (Author)

**AD-628 273 Fld. 20/9, 20/14**
*ARECIBO IONOSPHERIC OBSERVATORY PUERTO RICO*
**INDEX OF REFRACTION SURFACES FOR PLASMA WAVES,**
by Tyan Yeh, and Marshall H. Cohen. 15 Oct 64, 21p. Contract AF 49 (638)-1156,
AFOSR 65-2878

Unclassified report

*Availability: Published in Radio Science of Research NBS/USNC-URSI v69D n4 p539-57 Apr 1965. Copies to DDC users only.*

Descriptors: (*Plasma medium, Radio waves), (*Refractive index, Plasma medium), Wave transmission, Plasma oscillations, Ionospheric propagation, Radio astronomy

Surfaces of index of refraction have been calculated for the four modes which exist in a warm plasma, ignoring all damping mechanisms. The surfaces are displayed as contour diagrams. Dispersion curves are obtained as profile cuts through the surfaces. (Author)

**AD-628 292 Fld. 20/9**
*MICHIGAN UNIV ANN ARBOR DEPT OF AERONAUTICAL AND ASTRONAUTICAL ENGINEERING*
**THE GENERAL CONSERVATION LAWS IN A DILUTE PLASMA,**
by R. S. B. Ong. 15 Mar 65, 14p. Contract AF 49 (638)-1319,
AFOSR 65-2478

Unclassified report

*Availability: Published in I+* Nuovo Cimento n10 v38 p1835-48 Aug 16 1965. Copies to DDC users only.

Descriptors: (*Plasma physics, Kinetic theory), (*Kinetic theory, Plasma physics), Magnetohydrodynamics, Differential geometry

The macroscopic conservation equations for a dilute, fully ionized plasma are derived directly from the B-B-G-K-Y hierarchy instead of from the kinetic equation involving only the single-particle distribution function. In this way it is possible to exhibit clearly the role which the two-particle correlation function plays in the various macroscopic quantities. (Author)

**AD-628 317 Fld. 20/9, 20/13**
**CFSTI Prices: HC $3.60 MF $0.50**
*ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB*
**THERMODYNAMIC PROPERTIES OF AN ELECTRON PLASMA,**
by T. J. Lie, and Y. H. Ichikawa. Feb 66, 33p.
Rept. no. r-276,
Contract DA-28-043-AMC-00073 (E)

Unclassified report

Descriptors: (*Plasma medium, Electrons), (*Thermodynamics, Plasma medium), Statistical mechanics, Statistical functions, Series

The thermodynamic properties of electron plasma are investigated on the basis of Bogolinbov Born Green Kirkwood Yvon hierarchy equation. The correlation energy has been calculated up to the epsilon-squared term, (epsilon is the standard plasma parameter), in terms of an exact solution of the binary correlation function, taking into account the short range collision effect. The contribution of ternary correlation to the correlation energy has been determined in lowest order, which turns out to be of the second order in epsilon. Total sum of the corrections due to the short range collision effect and the ternary correlation effect is found to be in agreement with the result obtained by Abe, Bowers and Salpeter within the regime of Gibbs' statistical thermodynamics. Although the appearance of the binary correlation function obtained in the present studies differs from those derived by Bowers- Salpeter and by O'Neil-Rostoker, it is shown that all of these expressions are essentially equivalent. It is proved that these expressions do not describe correctly the way in which correlation effects diminish at a large distance. (Author)

**AD-628 323 Fld. 20/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH FLIGHT SCIENCES LAB*
**MAGNETIC INTERACTION EXPERIMENTS WITH SHOCK IONIZED NEON,**
by G. J. Mullaney, and E. A. Brown. Dec 65, 25p. Rept. no. d1-82-0499,Flight Sciences Lab-104

Unclassified report

Also available from the authors.

Descriptors: (*Gas ionization, Neon), (*Plasma medium, Fluid flow), Magnetic fields, Shock tubes, Magnetic pinch

A shock tube study of the ionization process in neon and its coupling with an axially symmetric magnetic field is described. Shock Mach number was about 14 and the calculated electron densities were 0 (10 to the 16th power/cc). The increase in plasma luminosity from the upstream to downstream side of the coil when the magnetic field (25 kilogauss range) was present, stimulated an investigation of the light emission with and without the magnetic field. The emission data and pressure measurements were used to substantiate the model of a magnetically formed diffuser. (Author)

**AD-628 327 Fld. 20/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF PHYSICS*
**PLASMA OSCILLATIONS.**
Final scientific rept.,
by K. G. Emeleus, and J. M. Jones. 30 Sep 65, 21p. Contract AF-EOAR-62-68, ARL 66-0019

Unclassified report

Descriptors: (*Plasma oscillations, Electron beams), Electrons, Ions, Turbulence, Low-pressure research, Electromagnetic waves, Stability

Investigations are described on the spontaneous oscillation of plasmas maintained by low-voltage electron beams in gas at a pressure of about 0.001 mm Hg. Previous work on oscillations in the plasma electron band (frequency of order of hundreds of Mc/s) and the plasma ion band (frequencies below a few Mc/s) is supplemented by observations on surface waves with frequencies in a broad intermediate band. The bearing of the electron-ion oscillation interaction on plasma turbulence is discussed. The interaction may permit of transfer of electron beam energy to thermal energy of the ions and gas.

**AD-628 464 Fld. 20/9, 7/4**
*MARYLAND UNIV COLLEGE PARK*
**THEORY OF WING BROADENING OF THE HYDROGEN LYMAN-ALPHA LINE BY ELECTRONS AND IONS IN A PLASMA,**
by Hans R. Griem. 24 May 65, 16p.

Unclassified report

Prepared in cooperation with Naval Research Lab., Washington, D. C. Supported by NSF, ONR and AFOAR.

*Availability: Published in The Physical Review v140 n4A pA1140-54 15 Nov 1965. Copies to DDC users only.*

Descriptors: (*Plasma medium, Atomic spectroscopy), (*Stark effect, Hydrogen), Electrons, Ions, Line spectrum, Perturbation theory

The frequency distribution of the absorption and emission coefficients on the wings of the hydrogen Lyman-alpha line broadened by local fields of both electrons and (quasistatic) ions in a plasma is calculated in the classical path approximation for regions well outside the half-intensity points. Depending on velocities and frequency separations from the line center, electron collisions are treated by an impact theory, which accounts both for Debye shielding and for the finite duration of the collisions, or by the quasistatic theory. Quadrupole interactions are considered in addition to the usual dipole interactions, and the (dominant) contribution of dipole interactions to the impact broadening is calculated to higher orders in the iterated solution of the time-dependent Schrodinger equation. Asymmetries introduced by quadratic Stark effect, by quadrupole interactions, by field-strength dependence of the oscillator strengths, and by the ion broadening of the central component through quadratic-Stark-effect and quadrupole interactions are evaluated. Also considered are asymmetries from the variation of factors usually assumed to be constant (frequencies and Boltzmann factors), and from the transformation from frequency to wavelength increments. Remaining theoretical uncertainties in the absolute values of absorption or emission coefficients for typical plasma conditions are estimated to be less than 10% over ranges in which these coefficients vary by three orders of magnitude. (Author)

**AD-628 467 Fld. 20/9, 20/4, 20/3**
*CASE INST OF TECH CLEVELAND OHIO*
**RAYLEIGH'S PROBLEM IN MAGNETOGASDYNAMICS WITH HALL EFFECT.**
Revised ed.,
by Pau-Chang Lu. 7 May 65, 6p. Contract NSF-G19000,

Unclassified report

Revision of manuscript submitted 5 Feb 65.

*Availability: Published in AIAA Journal v3 n12 p2219-24 Dec 1965. Copies to DDC users only.*

Descriptors: (*Magnetohydrodynamics, Hall effect), (*Hall effect, Compressible flow), Gas flow, Boundary layer, Argon, Viscosity

The boundary-layer solutions for large times of the velocity and temperature distributions in a gas, induced by the impulsive motion of an infinite flat plate in its own plane, are obtained by using the Karman-Pohlhausen technique. The gas is assumed to be thermally ionized through a combination of dissipative effects and heat supplied at the plate. The following two examples are given for seeded argon at about 2500K: (1) with Hall effect (strong magnetic field) and (2) without. (Author)

**AD-628 516 Fld. 20/9, 21/3**
**CFSTI Prices: HC $2.60 MF $0.50**
*GENERAL ELECTRIC CO PHILADELPHIA PA MISSILE AND SPACE DIV*
**DENSITY OF PULSED PLASMA.**
Final rept.,
by Gloersen Per. Jun 65, 21p. Contract AF 49 (638)-1174, Proj. AF-9752, Task 975201, AFOSR 65-1732

Unclassified report

Descriptors: (*Plasma medium, Density), (*Plasma engines, Exhaust gases), Absorption spectrum, Ultraviolet spectroscopy, Vacuum, Argon, Xenon, Spectrum analyzers

An absorption spectroscopy technique in the vacuum ultraviolet region was developed to measure the ion and neutral particle densities in the exhaust stream of a repetitively pulsed two-stage coaxial plasma propulsion engine by monitoring their various resonance absorption lines. The development of the plasma accelerator progressed to the point where argon was definitely ruled out as a suitable propellant. Xenon was found to be suitable and efforts were shifted towards extending the measuring techniques for use with xenon and other heavier propellants. In order to provide a better model for coaxial gun operation than hitherto available, some analytical effort was applied to the problem. The special casse of the stationary current sheet was brought to a successful conclusion both on the basis of energetics and the application of Faraday's law, starting from first principles. Extension of this analysis to cover the moving current sheet has been only partly successful to date in that a reasonable statement of the energetics could be made, but no consistent means has yet been found for applying Faraday's law.

**AD-628 518 Fld. 20/9**
*TORONTO UNIV (ONTARIO)*
**HARMONIC GENERATION BY A NONLINEAR PLASMA CYLINDER.**
Revised ed.,
by J. L. Yen, and N. C. McDermott. 18 Oct 65, 2p. Contract DRB-5540-02,

Unclassified report

Revision of manuscript received 2 Jul 65.

*Availability: Published in Applied Physics Letters v7 n10 p253-4 Nov 15 1965. Copies to DDC users only.*

Descriptors: (*Plasma oscillations, Resonance), (*Harmonic generators, Plasma oscillations), Electron density, Plasma medium

**AD-628 528 Fld. 20/9, 10/1**
**CFSTI Prices: HC $3.00 MF $0.50**
*STANFORD UNIV CALIF DEPT OF MECHANICAL ENGINEERING*
**DIRECT ENERGY CONVERSION SYSTEMS. PART I. ELECTRICAL CONDUCTIVITY OF PARTIALLY IONIZED GASES.**
Quarterly technical rept. 1 Mar-31 May 65,
by S. Schweitzer, and M. Mitchner. 30 Sep 65, 58p. Contract AF 49 (638)-1123,ARPA Order-246 Proj. AF-4661, AFOSR 66-0225

Unclassified report

Descriptors: (*Plasma medium, Electrical conductance), (*Electrical conductance, Plasma medium), Gases, Ionization, Electrons, Ions, Electromagnetic fields, Magnetohydrodynamic generators, Energy conversion, Plasma physics

A simplification of the Chapman-Enskog method for the calculation of the electrical conductivity of a multicomponent partially ionized gas in a magnetic field is presented. The calculation requires the inversion of a matrix which is of the order of the approximation, and is independent of the number of species. The third approximation to the electrical conductivity is examined for an electron-ion-neutral plasma and the results are compared with those obtained from the mixture rules of Lin, Resler, and Kantrowitz, and of Frost. It is shown that within the uncertainties in the experimental electron-neutral cross-section values, Frost's formula offers a satisfactory method of calculation for most engineering applications. (Author)

**AD-628 613 Fld. 20/9, 20/13**
**CFSTI Prices: HC $9.60 MF $0.75**
*MINNESOTA UNIV MINNEAPOLIS HEAT TRANSFER LAB*
**AN ANODE COMPARISON STUDY IN A WALL-STABILIZED ARGON ARC.**
Interim technical rept.,
by E. Pfender, G. D. Raithby, and E. R. G. Eckert. Nov 65, 94p. Contract AF 33 (657)-7380, Proj. AF-7063 Task 706303, ARL 65-232

Unclassified report

Descriptors: (*Electric arcs, Electrodes), (*Anodes, Cooling), (*Plasma jets, Anodes), Plasma medium, Argon, Power, Heat transfer, Graphite, Porous materials, Voltage

Experiments were conducted to determine whether or not transpiration cooling the anode of a cascaded, wall-stabilized, argon arc could substantially reduce the net power loss to the anode. A water-cooled copper anode and a geometrically similar porous graphite transpiration-cooled anode were used to make a direct comparison of the power losses. In addition, complete heat balances of the arc using both anode types were made. These measurements gave the losses to the other apparatus components. From these measurements and a proposed model for the energy transfer to the anode, anode fall values were calculated for the case of the water-cooled anode. In addition, the contribution of the various modes of energy transfer to the anode were determined. Heat flux measurements to the segmented constrictor tube were used to determine the local radiation and conduction to the wall. Also, measurements were made of the arc voltage - current characteristics and the voltage distribution along the plasma column from which the field strength can be determined. (Author)

**AD-628 637 Fld. 20/9**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**FORM OF THE ELECTRON DISTRIBUTION FUNCTION IN A TIME-VARYING PLASMA.**
Physical sciences research papers,
by Robert J. Papa. 12 Jan 65, 9p. Rept. no. AFCRL-PSRP-169,AFCRL-65-850
Proj. AF-4642, Task 464202,

Unclassified report

*Availability: Published in The Physics of Fluids, v8 n7 Jul 1965. Copies to DDC users only.*

Descriptors: (*Plasma medium, Electrons), (*Electrons, Distribution functions), Relaxation time, Density, Temperature

Conditions are explicitly derived which insure that the isotropic part of the electron distribution function remain Maxwellian in a time-varying, inhomogeneous plasma. These conditions are given in terms of the electron -density relaxation time, the electron-temperature relaxation time, the electron-diffusion time and the self-collision time. (Author)

**AD-628 662 Fld. 20/9**
**CFSTI Prices: HC $1.00 MF $0.50**
*BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH FLIGHT SCIENCES LAB*
**ELECTRICAL CONDUCTIVITY MEASUREMENTS IN A FARADAY ACCELERATOR,**
by Raymond Goldstein, J. Kenneth Richmond, and Gordon C. Oates. Nov 65, 23p. Rept. no. D1-82-0486,
Unclassified report

Also available from the authors.

Descriptors: (*Plasma accelerators, Electrical conductance), (*Magnetohydrodynamics, Electrical conductance), Plasma medium, Potassium, Argon, Magnetic fields, Voltage, Plasma sheath, Boundary layer, Supersonic flow

The paper discusses the results of an experimental study of a potassium seeded-argon atmospheric pressure Faraday accelerator. Electrical conductivity, with and without applied magnetic field, temperature of the electrodes, and potential distributions across the channel were measured. The channel was approximately 1 cm x 1 cm x 10 cm long and consisted of continuous Ta electrodes and BN sidewalls. The potential distributions across the channel, measured by means of Ta wires embedded in the sidewalls, show very large wall sheaths. Since the electrode temperatures are sufficiently high to give good thermionic emission, these large sheath voltage drops indicate the presence of thick boundary layers of low electrical conductivity. In the presence of a transverse magnetic field the measurements show that the boundary layers become thinner, as predicted by theory. The values of conductivity measured across the central core of the flow are compared with predictions of Kerrebrock's two-temperature theory, and the agreement between the measured and calculated values is good. These are probably the first conductivity measurements to be reported on an atmospheric pressure, supersonic gas flow with applied magnetic field. (Author)

**AD-628 729 Fld. 20/9, 20/4**
*POLYTECHNIC INST OF BROOKLYN FARMINGHAM N Y*
**NONLINEAR EFFECTS IN THE TWO-STREAM INSTABILITY,**
by J. P. Freidberg. 7 Oct 64, 9p. Contract AF 30(602)-2980,AF-AFOSR-453-63 Proj. AF-4751,
AFOSR 65-2451
Unclassified report

*Availability: Published in The Physics of Fluids, v8 n6 p1031-8 Jun 1965. Copies to DDC users only.*

Descriptors: (*Plasma physics, Two-phase flow), (*Fluid mechanics, Plasma physics), Electrons, Ions, Fluid flow, Traveling-wave tubes, Nonlinear systems

The problem of the nonlinear interaction of two cold interpenetrating electron and ion streams is treated. By seeking traveling-wave-type solutions to the nonlinear twofluid system of equations, an amplitude dependent dispersion relation is obtained. An examination of the solutions and the dispersion relation indicates that there is a range of values for k, where the two-stream stability levels off before the onset of overtaking. (Author)

**AD-628 777 Fld. 20/9**
**CFSTI Prices: HC $2.60 MF $0.50**
*MITRE CORP BEDFORD MASS*
**ELECTRON COLLISION FREQUENCY VERSUS CHARGED PARTICLE SEEDING,**
by J. Hoffman. Feb 66, 21p. Rept. no. W-07459, Contract AF 19(628)-2390, Proj. 705.1, ESD TR-65-402
Unclassified report

Descriptors: (*Plasma physics, Charged particles), (*Charged particles, Plasma physics), Density, Electrons, Particle trajectories, Electromagnetism

One method of controlling electromagnetic plasma interaction is by seeding the plasma with highly charged particles to obtain relatively large values of the collision frequency. This report contains a description of the maximum obtainable collision frequency as a function of ultrafine charged particle seeding parameters. (Author)

**AD-628 795 Fld. 20/9**
**CFSTI Prices: HC $2.00 MF $0.50**
*SYSTEMS RESEARCH LABS INC DAYTON OHIO*
**EXPERIMENTAL DETERMINATION OF ION EXCITATION ENERGIES AND DENSITIES IN A LOW PRESSURE DISCHARGE.**
Final scientific rept., May 64-Jul 65,
by Richard R. Corwin. Dec 65, 42p. Contract AF 33(615)-1798, Proj. AF-7073, ARL 65-246
Unclassified report

Descriptors: (*Gas discharges, Analysis), (*Plasma medium, Analysis), (*Atomic energy levels, Neon), (*Langmuir probes, Instrumentation), Lasers, Absorption, Measuring devices (Electrical + electronic), Electric current, Voltage, Density, Phase detectors, Energy, Excitation, Logarithmic amplifiers

An experiment is described for measuring the relative population densities of the energy levels of a neon plasma using a 'tuneable' helium-neon laser. Absorption measurements of the laser irradiation upon a neon plasma are made. A phase sensitive 'lock-in' amplifier is used as a detector which measures only the absorption of incident laser radiation and thus eliminates erroneous measurement of background light. Two specially constructed plasma diagnostic instruments are described. The first instrument measures the second derivative of Langmuir probe current with respect to probe voltage, and thus is a measure of the electron velocity distribution in a plasma. This instrument employs a phase sensitive detector which is a theoretically optimum technique for detecting small signals in the presence of noise. The second instrument is a simple logarithmic amplifier which displays, on an oscilloscope, the logarithm of the Langmuir probe current. The slope of the resulting oscilloscope trace is a measure of the electron temperature of the plasma. (Author)

**AD-628 228** **See Fld. 7/4**

**AD-628 239** **See Fld. 7/4**

**AD-628 320** **See Fld. 8/14**

**AD-628 347** **See Fld. 20/3**

**AD-628 616** **See Fld. 20/14**

**AD-628 658** **See Fld. 7/4**

## 20/10. QUANTUM THEORY

**AD-628 248 Fld. 20/10**
**CFSTI Prices: HC $2.00 MF $0.50**
*OREGON UNIV EUGENE DEPT OF PHYSICS*
**CONNECTED-DIAGRAM EXPANSION OF TRANSPORT COEFFICIENTS, II. QUANTUM GAS OBEYING CLASSICAL STATISTICS.**
Technical rept.,
by S. Fujita. Feb 66, 34p. Rept. no. TR-7, Contract Nonr-2771 (05) Proj. NR-017-633,
Unclassified report

Descriptors: (*Transport properties, Gases), (*Series, Statistical functions), Kinetic theory, Quantum mechanics, Statistical mechanics, Plasma physics

A connected-diagram expansion method is applied in the evaluation of the correlation function formulas for transport coefficients of an imperfect quantum gas obeying the classical statistics. The diagram expansion is independent of representation and could be applied to charged particles subjected to a magnetic field. The formal fugacity expansion of a transport coefficient is obtained in terms of the solution of a transport equation, which is in general linear and inhomogeneous. This expansion is in agreement with that derived by Kawasaki and Oppenheim, Phys. Rev. 139, A649 (1965), for a classical gas except for part of the field term. This formal expansion has a divergence difficulty. This difficulty can be eliminated by the summation of partial infinite fagacity series. It is shown that after the elimination of the difficulty, the expansion in powers of the density should be approximately valid at least in the first few orders. Terms in the combination of n (density) and ln n do not arise. (Author)

**AD-628 256 Fld. 20/10, 20/8**
**CTI Prices: HC $1.00 MF $0.50**
*NORTH CAROLINA UNIV CHAPEL HILL INST OF FIELD PHYSICS*
**JOINT REPORT TO AIR FORCE OFFICE OF SCIENTIFIC RESEARCH AND OFFICE OF NAVAL RESEARCH.**
Final rept., 1 Jan-31 Dec 65,
by Bryce S. Dewitt, and H. Van Dam. 31 Dec 65, 15p. Contract Nonr-855 (07),AF-AFOSR-153-63 Proj. NR-013-102,
Unclassified report

See also AD-619 183.

Descriptors: (*Armed forces research, Reports), (*Physics, Scientific research), Gravity, Quantum mechanics, Relativity theory, Field theory, Invariance, Abstracts

Summaries are given of work done in the following areas: Inner product in the cononical quantum theory of gravity; Theory of radiative corrections for non abelian gauge fields; Radiation damping in a gravitational field; Classical relativistic mechanics of interacting point particles; Asymptotic interaction angular momentum; Theorem of spinor-tensors; Conformal and projective riemann spaces; Pedagogical method in relativity theory; Photon bound states and gravitons; Effect of terms quadratic in the riemann tensor upon the field equations of general relativity; Proton-neutron mass difference; Spontaneous symmetry breakdown without massless bosons.

**AD-628 293 Fld. 20/10, 20/4**
*HARVARD UNIV CAMBRIDGE MASS*
**MICROSCOPIC THEORY OF SUPERFLUID HELIUM,**
by P. C. Hohenberg, and P. C. Martin. 17 Feb 65, 69p. Contract AF 49 (638)-1380, AFOSR 65-2801
Unclassified report

Supported in part by ARPA and NSF.

*AvailabilityPublished in Annals of Physics v34 n2 p291-359 Sep 1965. Copies to DDC users only.*

Descriptors: (*Helium, Superfluidity), (*Superfluidity, Theory), Condensation, Wave functions, Hydrodynamics, Spectroscopy,

Excitation, Quantum statistics, Phonons, Approximation (Mathematics), Perturbation theory, Green's function, Bosons, Thermodynamics

The paper discusses the properties of an interacting condensed Bose system, emphasizing those aspects which do not depend on the weakness of the potential, and which therefore apply to superfluid helium. A physical and mathematical characterization of Bose condensation is presented in terms of an additional macroscopic quantity, the wave function of the condensed mode, which is defined in terms of microscopic quantities. The hydrodynamic generalization applicable to slowly varying disturbances from equilibrium is then discussed and rigorous microscopic expressions are derived for the parameters of this theory (including dissipative coefficients). The elementary excitation spectrum in this collision dominated regime is exhibited. The Landau quasi-particle theory is examined, as well as the relation of condensation and the excitation spectrum, to the property of superfluidity. Under certain regularity assumptions the form of the long-wavelength excitation spectrum at vanishing temperature is deduced. Finally, techniques are discussed for evaluating properties of the Bose system starting from the interaction potential. (Author)

**AD-628 315 Fld. 20/10, 12/1**
**CFSTI Prices: HC $4.60 MF $0.50**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**THE CALCULATION OF UPPER AND LOWER BOUNDS OF ENERGY EIGENVALUES IN PERTURBATION THEORY BY MEANS OF PARTITIONING TECHNIQUE,**
by Per-Olov Lowdin. 1 Oct 65, 45p. Rept. no. scientific-44,
Contract AF 61 (052)-701,
ARL 66-0021

Unclassified report

Descriptors: (*Perturbation theory, Boundary value problems), (*Quantum mechanics, Perturbation theory), Series, Operators (Mathematics), Wave functions, Calculus of variations

The partitioning technique for solving the eigenvalue problem, H psi = E psi, is briefly reviewed in matrix and operator form. It is shown that, if R is a real variable, one may construct a single- or multivalued function S = f (R) such that each pair R and S bracket at least one true eigenvalue E. If R is chosen as an upper bound by means of the variation principle, the function S is hence going to provide a lower bound. The partitioning technique is here used to derive Brillouin-type and Schrodinger-type perturbation expansions and, in the case of a positive definite perturbation V>0, upper and lower bounds for the sums are determined by means of operator inequalities. By using the method of 'inner projection', it is further shown that the remainders in the Brillouin-type expansion may be evaluated with any accuracy desired, and the corresponding problem for the Schrodinger-type expansion is briefly discussed. Numerical applications are given elsewhere. (Author)

**AD-628 316 Fld. 20/10**
**CFSTI Prices: HC $2.60 MF $0.50**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**QUANTUM THEORY OF MANY-PARTICLE SYSTEMS.**
Final rept. 1 Sep 63-31 Oct 65,
by Per-Olov Lowdin. 31 Oct 65, 23p. Contract AF 61 (052)-701,
ARL 66-0022

Unclassified report

Descriptors: (*Quantum mechanics, N-body problem), (*N-body problem, Quantum mechanics), Matrix algebra, Field theory, Molecules, Solids

A summary of research is given for basic quantum mechanics and perturbation theory, symmetry properties, density matrices, field-theoretical methods, and applications to molecules and solids. Research reports and published papers are listed.

**AD-628 329 Fld. 20/10, 12/1**
**CFSTI Prices: HC $4.60 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**THE NULL BUNDLE OF AN EINSTEIN-RIEMANN SPACE II: NORMED NULL BASES,**
by Dominic G. B. Edelen. Feb 66, 49p. Rept. no. RM-4872-PR,
Contract AF 49 (638)-1700,

Unclassified report

Descriptors: (*Tensor analysis, Field theory), (*Relativity theory, Partial differential equations), Differential geometry, Algebraic topology, Gravity

This memorandum presents the theory of normed null bases in a hyperbolic-normal, 4-dimentional metric space E; i.e., the structure and properties of all systems of four linearly independent, complex-valued, null vector fields that satisfy the given normalization conditions. It is shown that the system of all normed null bases can be obtained from a given normed null basis by the action of a group of anholonomic matrices that are generated from the group of all Jacobian matrices of the Lorentz group under all mappings of the group parameters onto functions of position in E. The anholonomic frames, anholonomic connections, and objects of anholonomy arising from normed null bases are studied and a fundamental existence theorem is obtained. This existence theorem replaces all equations involving the anholonomic quantities of an unknown normed null basis by equations involving a known normed null basis and the matrices described above. These results are applied to the systems of partial differential equations obtained in a previous report, as well as to the general Einstein equations. Explicit solutions are obtained, for purposes of illustration, when a particular form of the C-matrices is assumed. These solutions represent among other things, the gravitational fields of a rod, of two parallel rods, and of two photons, and raise some interesting questions concerning gravitational radiation. (Author)

**AD-628 330 Fld. 20/10, 12/1**
**CFSTI Prices: HC $3.60 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**THE NULL BUNDLE OF AN EINSTEIN-RIEMANN SPACE I: GENERAL THEORY,**
by Dominic G. B. Edelen. Feb 66, 31p. Rept. no. RM-4871-PR,
Contract AF 49 (638)-1700,

Unclassified report

Descriptors: (*Tensor analysis, Field theory), (*Relativity theory, Tensor analysis), Partial differential geometry, Differential geometry, Algebraic topology, Gravity

This memorandum examines the structure of all hyperbolic-normal, 4-dimensional metric spaces whose metric tensor can be written in the form h sub AB = g sub AB + l sub A l sub B where g sub AB is a metric tensor of a given hyperbolic-normal metric space E and l sub A is a null vector in E. The set of all such spaces is termed the null bundle of the space E. Necessary and sufficient conditions are given for selecting elements of the null bundle of E that have the same Ricci tensor and/or the same Einstein tensor. In contrast to the general element of the null bundle, these elements are shown to be defined in terms of systems of partial differential equations that are homogeneous in the unknowns. It thus follows that all such elements of the null-bundle are continuously connected to the space E and lie along rays through E in the natural parameterization of the null bundle. These results provide the natural generalization of the results of Kerr and Schild to the cases for which the space E is intrinsically curved and for which the momentum-energy tensor does not vanish. (Author)

**AD-628 343 Fld. 20/10**
*IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS*
**ON THE NONLINEAR PROPERTIES OF RETARDED PRODUCTS,**
by R. F. Streater. 4 Mar 65, 17p. Contract AF-EOAR-46-64,
AFOSR 65-2799

Unclassified report

*Availability: Published in Annals of Physics, v33 n3 p311-27 Jul 1965. Copies to DDC users only.*

Descriptors: (*Field theory, Quantum mechanics), (*Quantum mechanics, Operators (Mathematics)), Functions, S-matrix

A set of functions t is given that satisfies the unitarity equations appropriate for time-ordered functions of n current operators, n = 4, 5,.... In terms of functions t, r is defined for each order n which correspond to the generalized retarded functions of axiomatic local quantum field theory. Using the technique of generating functionals, the corresponding 'products of operators' T and R are defined. The t and r are well defined as distributions in momentum space, possibly not tempered; and the time-ordered and retarded operators are also distributions in momentum space, and as operators in Fock space have reasonable domains of definition. It is found that the commutator between any two retarded operators can be expressed as sums and differences between retarded operators of order n + m. The various r-functions coincide in some region of momentum space, and any given r coincides with the t-function in the region of momentum space appropriate to the function r. The R-operators trivially satisfy the Steinmann relations. Thus many of the 'linear' properties of the retarded operators that follow from causality and Lorentz invariance also follow from unitarity, when no locality is assumed. (Author)

**AD-628 409 Fld. 20/10, 20/8**
*COLORADO UNIV BOULDER DEPT OF PHYSICS*
**RENORMALIZED PERTURBATION SERIES OF ELECTRODYNAMICS FROM S-MATRIX THEORY,**
by A. O. Barut, and R. A. Blade. 17 Apr 65, 15p. Contract AF-AFOSR-30-63,
AFOSR 65-2791

Unclassified report

*Availability: Published in Il Nuovo Cimento, S10 v39 p331-43 Sep 10 1965. Copies to DDC users only.*

Descriptors: (*Field theory, S-matrix), (*Perturbation theory, Series), Quantum mechanics, Electromagnetic waves

Electromagnetic processes are evaluated using extended unitarity and analyticity of the scattering amplitude. Assuming e sq to be small, a successive pole approximation of the unitarity relation and appropriate approximative analyticity assumptions to every order in e sq are shown to be equivalent to renormalized Feynman perturbation theory. (Author)

**AD-628 414 Fld. 20/10**
*OSLO UNIV (NORWAY) INST FOR THEORETICAL PHYSICS*
**EXACT QUANTUM DYNAMICAL SOLUTIONS FOR OSCILLATOR-LIKE SYSTEMS,**
by Marius Kolsrud. 1956, 24p. Rept. no. Institute-28,
Contract AF-EOAR-32-64,
AFOSR 65-2754

Unclassified report

Presented at the Meetings of the Norwegian Physical Society held in Bergen 1953 and in Oslo 1955.

*Availability: Published in Physica Mathematica Universitatis Osloensis pl-25. Copies to DDC users only.*

Descriptors: (*Quantum mechanics, Oscillation), Equations of motion, Operators (Mathematics), Time, Potential theory, Norway

There are very few cases in which the exact solutions of the quantum-mechanical equations of motion are known. For a certain class, however, it is possible to obtain explicit solutions, or rather to express the quantummechanical solutions in terms of the classical ones. This class consists of systems whose Hamiltonians are polynomials of the second degree in canonically conjugate dynamical variables (i.e. 'oscillator-like'). As these systems play a rather important role in quantum theory, it seems worth while to present an exact treatment of their dynamics. In order to study the variation with time of the state-or of the dynamical variables-of a system, it is convenient to introduce the unitary 'timeevolution' operator T. An explicit expression for the operator T is found.

**AD-628 636 Fld. 20/10**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**IMPROVED METHOD FOR QUANTUM MECHANICAL THREE-BODY PROBLEMS. I. ATTRACTIVE POTENTIALS.**
Physical and mathematical sciences research papers,
by Leonard Eyges. 7 Jan 65, 16p. Rept. no. AFCRL-PMSRP-171,AFCRL-65-863
Proj. AF-5621, Task 562104,
Unclassified report

*Availability: Published in Journal of Mathematical Physics, v6 n8 p1320-8 Aug 1965. Copies to DDC users only.*

Descriptors: (*Quantum mechanics, N-body problem), (*N-body problem, Potential theory), Elementary particles, Wave functions, Ground state, Integral equations

The quantum-mechanical ground-state problem for three identical particles bound by attractive interparticle potentials is discussed. For this problem it has previously been shown that it is advantageous to write the wavefunction in a special functional form, for which an integral equation which is equivalent to the Schrodinger equation was derived. A new method for solving this equation is presented. The method involves an expansion in a set of 'effective' two-body functions; these are the eigenfunctions of a two-body problem with a potential of the same shape as the interparticle potential in the three-body problem, but of enhanced strength. (Author)

**AD-628 739 Fld. 20/10, 20/8**
*IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS*
**SPONTANEOUS BREAKDOWN OF SYMMETRY IN AXIOMATIC THEORY,**
by R. F. Streater. 2 Mar 65, 9p. Contract AF-EOAR-46-64,
AFOSR 65-2694
Unclassified report

*Availability: Published in Proceedings of the Royal Society, A, v287 p510-8 1965. Copies to DDC users only.*

Descriptors: (*Field theory, Operators (Mathematics)), (*Elementary particles, Field theory), Invariance, Quantum mechanics, Functions, Transformations (Mathematics), Great Britain

Two results are proved; the first is that it is possible to prove Goldstone's theorem in a Wightman theory in which there is a conserved current with a meaning for a sharp time and which generates a broken symmetry. The second is that for such theories there exist infinitely many positive linear functionals on the algebra of quasi -local operators, that are Lorentz invariant and lead to a theory with positive energy. That is, the vacuum functional is non-unique. These two results are illustrated in the theory of the free massless neutral scalar field. (Author)

**AD-628 834 Fld. 20/10, 20/8, 7/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP*
**TABLE OF SANIBEL (SPIN PROJECTION) COEFFICIENTS.**
Scientific rept.,
by Rolf Manne. 15 Jun 65, 64p. Rept. no. Scientific-47,
Contract AF 61 (052)-701, Proj. AF-7112,
ARL 66-0037
Unclassified report

Descriptors: (*Nuclear spins, Momentum), (*Momentum, Tables), Particles, Quantum mechanics, Algorithms, Sweden

Projection coefficients for total spin angular momentum of systems of 0 - 20 particles with spin 1/2, calculated on a digital computer, are given in tabular form.

**AD-628 120** **See Fld. 7/4**

**AD-628 261** **See Fld. 7/4**

**AD-628 288** **See Fld. 20/8**

**AD-628 481** **See Fld. 7/4**

**AD-628 482** **See Fld. 7/4**

**AD-628 519** **See Fld. 20/12**

## 20/11. SOLID MECHANICS

**AD-628 054 Fld. 20/11**
**CFSTI Prices: HC $4.00 MF $0.75**
*COLUMBIA UNIV NEW YORK DEPT OF CIVIL ENGINEERING AND ENGINEERING MECHANICS*
**STEP LOAD MOVING WITH SUPERSEISMIC VELOCITY ON THE SURFACE OF AN ELASTIC-PLASTIC HALF-SPACE.**
Technical rept.,
by H. H. Bleich, and A. T. Matthews. Dec 65, 104p. Rept. no. TR-38,CU-4-65-ONR-266 (86)-CE
Contract Nonr-266 (86), Proj. NR-064-428,
Unclassified report

Descriptors: (*Seismic waves, Propagation), (*Loading (Mechanics), Elasticity), Plasticity, Strain (Mechanics), Equations of motion, Nonlinear differential equations, Surface properties, Velocity

The plane strain problem of a step load moving with uniform superseismic velocity on the surface of a half-space is considered for an elastic-plastic material obeying the von Mises yield condition. Using dimensional analysis the governing quasi-linear partial differential equations are converted into ordinary nonlinear differential equations which are solved numerically using a digital computer. To overcome computing difficulties asymptotic solutions are derived in the vicinity of a singular point of the differential equations. Typical numerical results are presented for selected values of significant non-dimensional parameters, i.e. of the surface load, of Poisson's ratio, and of the velocity ratio. (Author)

**AD-628 174 Fld. 20/11, 1/2**
**CFSTI Prices: HC $4.60 MF $0.50**
*TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF AERONAUTICAL ENGINEERING*
**EFFECT OF ECCENTRICITY OF STIFFENERS ON THE GENERAL INSTABILITY OF STIFFENED CYLINDRICAL SHELLS UNDER TORSION,**
by Manahem Baruch, Josef Singer, and Tanchum Weller. Aug 65, 44p. Rept. no. Scientific-3, Contract AF-EOAR-58-63, Proj. AF-9782, Task 978201,
AFOSR 65-2753
Unclassified report

Descriptors: (*Stiffened cylinders, Structural shells), (*Structural shells, Stiffened cylinders), (*Buckling (Mechanics), Structural shells), Torsion, Stability, Numerical analysis, Israel

A method of analysis of eccentrically stiffened cylindrical shells, developed earlier, is applied to buckling under torsion. In the calculations about 350 shells covering a wide range of shell and stiffener geometries have been considered. It is found that for long cylinders rings are the important stiffeners, and internal rings stiffen more than external rings. For short cylinders the effect is inverted, external rings yielding higher critical loads than internal rings. Stringers have little effect in long cylinders, but in short cylinders they stiffen the shell against buckling in torsion as much as rings. Outside stringers always stiffen the shell more than inside stringers. (Author)

**AD-628 216 Fld. 20/11**
**CFSTI Prices: HC $1.60 MF $0.50**
*MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MECHANICAL ENGINEERING*
**COUPLED VIBRATORY SYSTEM ANALYSIS USING THE DUAL FORMULATION.**
Scientific rept.,
by Dean Karnopp. Nov 65, 16p. Contract AF 49 (638)-1314, Proj. AF-9782, Task 978201,
AFOSR 65-2675
Unclassified report

Descriptors: (*Vibration, Structure), Equations of motion, Force (Mechanics), Dynamics, Boundary value problems, Rods

Principles by means of which an arbitrary vibrational system may be cut into subsystems and described by coupled model equations are exposed and illustrated with an elementary example. The symmetry of the equations attainable when both the usual geometric description and the dual or force space representation are used is shown. The difficulties in use and interpretation of the coupled quations when the coupling is not weak are discussed. (Author)

**AD-628 258 Fld. 20/11, 20/13**
*PRINCETON UNIV N J DEPT OF AEROSPACE AND MECHANICAL SCIENCES*
**THERMOELASTICITY WHEN THE MATERIAL COUPLING PARAMETER EQUALS UNITY,**
by O. W. Dillon,Jr.. 1 May 64, 5p. Contract AF 49 (638)-1306,
AFOSR 65-2480
Unclassified report

Presented at the Applied Mechanics/Fluids Engineering Conference, Washington, D. C. Jun 7-9 1965, of the American Society of Mechanical Engineers.

*Availability: Published in Journal of Applied Mechanics Jun 1965. Copies to DDC users only.*

Descriptors: (*Elasticity, Thermal properties), (*Thermal properties, Materials), Rods, Strain (Mechanics), Stresses, Surface properties

Analytical solutions of three problems in coupled thermoelasticity are presented for the case when the material coupling parameter equals unity. The problems considered are: (a) Danilovskaya's problem of a step function in temperature at the sur-

face; (b) a step function in surface strain; and (c) constant velocity impact. Solutions are presented for the case of thin bars (one-dimensional stress) and are obtained by the Laplace-transform technique. There is great simplification in the equations when the material coupling parameter equals unity which permits the straightforward inversion of the transformed solutions. The results demonstrate significant deviations from the corresponding uncoupled solutions. (Author)

**AD-628 307 Fld. 20/11**
**CFSTI Prices: HC $21.60 MF $1.25**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**SONIC AND ULTRASONIC OSCILLATIONS DURING DYNAMIC TESTS OF MATERIALS,**
by V. A. Kuzmenko. 8 Nov 65, 220p. Rept. no. FTD-MT-64-385, TT 66-60581

Unclassified report

Edited machine trans. of mono. Zukovye i Ultrazvukovye Kolebaniya pri Dinamicheskikh Ispytaniyakh Materialov, Kiev, 1963 152p.

Descriptors: (*Materials, Dynamics), (*Dynamics, Materials), Tests, Rods, Mechanical properties, Ultrasonic radiation, Sound, Oscillation, Elasticity, Fatigue (Mechanics), Test methods, Structural parts, Metals

In book are illuminated certain methods of application sonic and ultrasonic oscillations for study of characteristics of elasticity, inelasticity and fatigue; along with classification and description of experimental method there are considered structural diagrams of different test installations used for studying the indicated characteristics of mechanics of materials; given is a number of new experimental data on mechanical properties of metals; given is certain useful information on sonic and ultrasonic technology. (Author)

**AD-628 398 Fld. 20/11, 11/6**
*PRINCETON UNIV N J*
**EXPERIMENTAL DATA ON ALUMINUM AS AN UNSTABLE SOLID,**
by O. W. Dillon Jr., 1963, 18p. Contract AF-AFOSR-406-63, AFOSR 65-2474

Unclassified report

*Availability: Published in International Congress on Rheology (4th), Providence, R. I. Aug 1963. Copies to DDC users only.*

Descriptors: (*Aluminum, Mechanical properties), Rheology, Loading (Mechanics), Stability, Strain (Mechanics), Stresses, Deflection, Mechanical waves, Theory

Data are presented on annealed aluminum where large changes in strain occur long after the load increment has been applied. These changes occur suddenly and frequently, without warning. The specimens are loaded in small increments with many minutes between loads. In this way a good approximation to equilibrium exists at the time the increase in load is added. It is shown that very slow 'waves' exist in the material. This means that in tests made at more conventional loading rates, the material frequently is not actually in equilibrium. These waves travel at speeds which are more than five orders of magnitude slower than those based on conventional test results.

**AD-628 491 Fld. 20/11, 11/6**
**CFSTI Prices: HC $2.00 MF $0.50**
*ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS MATERIALS ENGINEERING DIV*
**PLASTIC BEHAVIOR OF METALS AT CRYOGENIC TEMPERATURES.**
Technical rept.,
by Eric B. Kula, and Thomas S. DeSisto. Dec 65, 30p. Proj. D/A-1C024401A110, Task 35841, AMRA TR-65-32

Unclassified report

Presented at Symposium on The Plastic Behavior of Metals at Cryogenic Temperatures, Annual Meeting of American Society for Testing and Materials, Purdue Univ., Lafayette, Ind., 14 Jun 1965.

Descriptors: (*Metals, Creep), (*Cryogenics, Metals), Stresses, Strain (Mechanics), Iron, Titanium, Nickel alloys, Copper alloys, Crystal structure, Deformation, Loading (Mechanics), Heating, Geometric forms, Plasticity

The serrated yielding exhibited by metals during tension tests at temperatures near absolute zero is the principal consideration of the paper. Stress-strain curves are presented for various metals including Armco iron, 'K' Monel, and titanium at temperatures from +200 to -269 C. The variations of yield stress and ductility are shown to depend primarily on crystal structure. At -269 C, serrated yielding occurs in many metals. This is caused by adiabatic heating, and can occur independently of the deformation mechanism. A partial differential equation is derived relating load to strain hardening, strain rate, and thermal softening. At cryogenic temperatures, it is shown that thermal softening becomes so large that maximum load is exceeded, and discontinuous yielding occurs. During yielding, heating occurs, reducing the therma-softening term, and serration ceases. (Author)

**AD-628 508 Fld. 20/11**
**CFSTI Prices: HC $13.45 MF $4.00**
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**STABILITY OF ELASTIC SYSTEMS,**
by A. S. Volmir. 15 Nov 65, 1045p. Rept. no. FTD-MT-64-335, TT 66-60623

Unclassified report

Edited machine trans. of mono. Ustoichivost Uprugikh Sistem, Moscow, 1963 879p.

Descriptors: (*Elasticity, Stability), (*Elastic shells, Stability), (*Rods, Stability), (*Metal plates, Stability), Buckling (Mechanics), Creep, Aeroelasticity, Panels - (Structural), Structural shells, Cylindrical bodies, Temperature, Loading (Mechanics), Spheres, Statistical analysis, Sandwich construction, Sandwich panels, USSR

Author sets himself the goal to summarize research in those sections of the theory of stability of bars, plates and shells, which have at present the greatest practical value. In book there is considered a series of new problems, appearing in recent years in connection with requirements of industry (especially aircraft construction) and construction. There are presented, in particular, theoretical and experimental data obtained by author and his colleagues on dynamic stability of elastic systems, buckling of shells 'in the large' during creep, etc. In book are given tables and graphs, which can be directly used in practical calculations. There are given certain numerical examples. (Author)

**AD-628 599 Fld. 20/11, 22/2**
**CFSTI Prices: HC $6.00 MF $1.50**
*NAVAL RESEARCH LAB WASHINGTON D C SHOCK AND VIBRATION INFORMATION CENTER*
**THE SHOCK AND VIBRATION BULLETIN.**
Jan 66, 276p. Rept. no. Bulletin 35-pt 2,

Unclassified report

Descriptors: (*Shock (Mechanics), Symposia), (*Vibration, Symposia), Periodicals, Mechanics, Structures, Loading (Mechanics), Spacecraft, Vibrators (Mechanical), Turbine parts, Test methods

Contents: Theory of dynamic tests of structures; Fatigue life under various random loading spectra; Combined broadband and stepped narrowband random vibration; On the use of multiple (multipoint) random excitation with application to surveyor spacecraft tests; Ground test simulation of lift-off and transonic vibration excitation mechanisms on the ranger spacecraft; Methods of control of multiple shaker testing system; On synergetic effects of combinations of vibration and other environments; A multiple-frequency, shake-testing technique for structures with rapidly-changing dynamic characteristics; A progress report on force controlled vibration testing; Vibration on sandwich panels in a vacuum; The vibration design approval and acceptance test program for the gemini spacecraft-component, module and whole vehicle testing; Techniques for extending the capability of random equilization equipment; A broadband hydraulic vibration exciter; Advantages of multipoint control for vibration testing of complete ranger flight spacecraft; Vibration input control investigation; A unique suspension system for longitudinal vibration testing of large launch vehicles; Combined random vibration and extreme temperature testing of integrated circuits; Implications of spacecraft vibration qualification testing requirements on structural design; Use of impulsive loading techniques in the study of ship vibration; The relationship between a logarithmically swept excitation and the build-up of steady-state resonant response; Analysis of the rotor blade vibratory stresses of the propulsion wind tunnel compressors.

**AD-628 600 Fld. 20/11, 1/2**
**CFSTI Prices: HC $6.00 MF $1.50**
*NAVAL RESEARCH LAB WASHINGTON D C SHOCK AND VIBRATION INFORMATION CENTER*
**THE SHOCK AND VIBRATION BULLETIN.**
Jan 66, 282p. Rept. no. Bull-35-Pt-3,

Unclassified report

Symposium on Shock, Vibration and Associated Environments (35th) was held in New Orleans, La., on 25-28 Oct 65.

Descriptors: (*Shock (Mechanics), Symposia), (*Vibration, Symposia), Structures, Mathematical analysis, Rockets, Sandwich construction, Loading (Mechanics), Spacecraft

Contents: Response of rocket vehicle structure to certain environmental loads; Effects of orthotropic cores on the free vibrations of sandwich plates; Effect of inertia variation and certain asymmetries on the dynamic response of an elastically-coupled system; Steadystate response of a multi-degree of freedom system subjected to random excitation; Vibrations of multilayer shells of revolution under dynamic and impulsive loading; Random vibrations of a multi-supported heavily-damped beam; Cumulative damage caused by shock excitation; Some lattice vibration problems; Solution of dynamic beam problems by means of finite cis-hyperbolic transforms; Random vibrations and random functions; Analytical and experimental techniques used to establish structural design loads for the surveyor spacecraft during lunar landing; Dynamic aspects of metal bellows; Lifetime evaluation procedures for random shock and vibration; Application of the direct stiffness method to the elastic mathematic modeling of the saturn S-1B; Acoustic waves generated by the motion of piping containing a fluid; Analysis of the effects of dynamic coupling between structural resonances and a time sampling data control system; Transient response of linear damped, lumped, springmass systems by experimentally derived transfer functions; Investigation of dynamic characteristics of a 1/20th scale model of the launch phase simulator.

**AD-628 623 Fld. 20/11**
*PRATT AND WHITNEY AIRCRAFT EAST HARTFORD CONN*
**TRANSIENT VIBRATION OF THIN ELASTIC SHELLS,**

by H. Kraus, and A. Kalnins. 1965, 10p. Contract DA-31-124-ARO (D)-146, AROD 4367:3

Unclassified report

*Availability: Published in Journal of Acoustical Society of America v38 n6 p994-1002 Dec 1965. Copies to DDC users only.*

Descriptors: (*Elastic shells, Vibration), Loading (Mechanics), Surface properties, Mathematical analysis, Equations of motion, Spheres

A complete solution for the response of an arbitrary shell subjected to time-dependent surface loads is derived by means of the classical method of spectral representation. The solution is expanded in terms of the modes of free vibration, and their orthogonality is proved for an arbitrary shell. As an example, the response of a spherical shell to a suddenly applied uniform normal load is calculated in detail. (Author)

**AD-628 653 Fld. 20/11, 20/1**
*NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST*
**RESPONSE OF A SUBMERGED CYLINDRICAL SHELL TO AN AXIALLY PROPAGATING STEP WAVE,**
by M. J. Forrestal, and G. Herrmann. 29 May 64, 5p. Contract DA-ARO (D)-31-124-G534, AROD 4550:1

Unclassified report

*Availability: Published in Journal of Applied Mechanics, Dec 1965. Copies to DDC users only.*

Descriptors: (*Cylindrical bodies, Mechanical waves), (*Structural shells, Mechanical waves), Acoustic properties, Stresses, Fluid dynamic properties, Equations of motion, Deformation, Underwater objects, Shear stresses, Inertia

An infinitely long, circular, cylindrical shell is submerged in an acoustic medium and subjected to a plane, axially propagating step wave. The fluid-shell interaction is approximated by neglecting fluid motions in the axial direction, thereby assuming that cylindrical waves radiate away from the shell independently of the axial coordinate. Rotatory inertia and transverse shear deformations are included in the shell equations of motion, and a steady-state solution is obtained by combining the independent variables, time and the axial coordinate, through a transformation that measures the shell response from the advancing wave front. Results from the steady-state solution for the case of steel shells submerged in water are presented using both the Timoshenko-type shell theory and the bending shell theory. It is shown that previous solutions, which assumed plane waves radiated away from the vibrating shell, overestimated the damping effect of the fluid, and that the inclusion of transverse shear deformations and rotatory inertia have an effect on the response ahead of the wave front. (Author)

**AD-628 702 Fld. 20/11**
*NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST*
**BUCKLING OF A LONG CYLINDRICAL SHELL CONTAINING AN ELASTIC CORE.**
Revised ed.,
by G. Herrmann, and M. J. Forrestal. 17 Feb 65, 7p. Contract AF-AFOSR-100-64, AFOSR 65-2483

Unclassified report

Revision of manuscript submitted 18 Apr 64.

*Availability: Published in American Institute of Aeronautics and Astronautics Journal v3 n9 p1710-15 1965. Copies to DDC users only.*

Descriptors: (*Buckling (Mechanics), Cylindrical bodies), Elasticity, Stresses, Loading (Mechanics), Hydrostatic pressure

A long, thin, circular cylindrical shell containing an elastic core, bonded to the inner surface of the shell, is subjected to a uniform external hydrostatic pressure. Stability of equilibrium of the shell is investigated by considering possible neighboring equilibrium states. The loading exerted by the elastic core on the shell in the deformed state is found by solving an associated boundary value problem of the linearized theory of elasticity in the presence of initial stresses. An expression for the buckling pressure of the shell is derived, and results are presented for a wide range of shell and medium parameters. (Author)

**AD-628 715 Fld. 20/11, 11/9**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**SHOCK WAVE COMPRESSION OF 'PLEXIGLAS' IN THE 2.5 TO 20 KILOBAR REGION,**
by D. N. Schmidt, and Marjorie W. Evans. 1965, 5p. Contract AF 49 (638)-1124, Proj. AF-9711, Task 971101, AFOSR 65-2492

Unclassified report

*Availability: Published in Nature, v206 n4991 p1348-9 Jun 26 1965. Copies to DDC users only.*

Descriptors: (*Acrylic resins, Compressive properties), (*Shock waves, Acrylic resins), High-pressure research, Attenuation, Shear stresses, Acoustics

The dynamic compressibility of 'Plexiglas' in the range from 2.5 to 20 kbar was studied using the wedge and optical lever technique described by Fowles. Cast 'Plexiglas', determined by photoelastic examination to be freer of structure and residual strain than extruded or moulded material, was used. The results imply the existence of a maximum shear stress of 1.5 times the observed stress difference, that is 1.5 x 3 kbar = 4.5 kbar. The reduction of critical shear stress to 1.5 x 2 kbar = 3 kbar at the higher shock amplitude may be due to the associated temperature increase, which is estimated to be 60C. The absence of a precursor wave is reflected in the pressure-volume curve as a positive monotonic second derivative. This implies that yielding occurs over a range of stresses and cannot be assigned a definite value. (Extracted)

**AD-628 716 Fld. 20/11, 11/9, 21/9.2**
*PENNSYLVANIA STATE UNIV UNIVERSITY PARK*
**EXPERIMENTAL INVESTIGATIONS ON THE DYNAMIC COMPRESSIBILITIES OF POLYMERIC MATERIALS,**
by M. G. Sharma, and V. McCarty. 1965, 15p. Contract DA-31-124-ARO (D)-116, AROD 3263:13

Unclassified report

*Availability: Published in Applied Polymer Symposia, n1 p201-15 1965. Copies to DDC users only.*

Descriptors: (*Polymers, Compressive properties), (*Polyethylene plastics, Compressive properties), (*Solid rocket propellants, Compressive properties), Test equipment, Solid rocket propellant binders, Nitrile rubber, Vibration, Frequency, Hydrostatic pressure, Creep, Viscoelasticity

The paper describes an apparatus for determining the dynamic compressibilities of polymeric materials at the frequency range of 0.0001 to 0.1 cycle/sec. The apparatus makes it possible to impose sinusoidal hydrostatic stress on the samples and measure the associated volume changes. The paper reports the studies on the dynamic compressibilities of two polymeric materials, namely an inert solid fuel propellant and a filled low density polyethylene. From the observed quantities, bulk (volume) storage and loss compliances are determined for the frequency range mentioned earlier. The results indicate that the bulk (volume) storage compliance decreases with the frequency of fluctuation and the bulk (volume) loss compliance shows a peak in the region. Finally, the dynamic behavior is predicted from the results of static creep experiments under hydrostatic stress, utilizing the well known Boltzmann superposition principle. (Author)

**AD-628 736 Fld. 20/11**
*NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST*
**VIBRATION OF THIN SHELLS UNDER INITIAL STRESS,**
by George Herrmann, and John Shaw. 1965, 26p. Contract AF-AFOSR-100-63, AFOSR 2484

Unclassified report

*Availability: Published in Journal of the Engineering Mechanics Division, Proceedings of the American Society of Civil Engineers v91 nEM5 p37-59 Oct 1965. Copies to DDC users only.*

Descriptors: (*Elastic shells, Vibration), (*Vibration, Elastic shells), Cylindrical bodies, Structural shells, Bending, Theory, Frequency, Equations of motion, Stresses, Pressure, Resonance, Elasticity

Using a general bending theory of circular cylindrical shells under the influence of initial stress, simple but accurate expressions for the resonant frequency are presented. These expressions are applicable to a wide range of shell parameters. The results are compared with those of previous investigations. Experimental results are also given. (Author)

**AD-628 738 Fld. 20/11**
*NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST*
**BUCKLING OF A LONG CYLINDRICAL SHELL SURROUNDED BY AN ELASTIC MEDIUM,**
by Michael J. Forrestal, and George Herrmann. 15 Oct 64, 13p. Contract AF-AFOSR-100-64, Proj. AF-9782, Task 978201, AFOSR 65-2482

Unclassified report

*Availability: Published in Int. J. Solids Structures, v1 p297-309 1965. Copies to DDC users only.*

Descriptors: (*Buckling (Mechanics), Structural shells), (*Structural shells, Cylindrical bodies), Elasticity, Stability, Loading (Mechanics), Boundary value problems

A long, thin, circular, cylindrical shell is subjected to uniform external pressure exerted by a surrounding elastic medium. The stability of equilibrium of the shell is examined by considering possible neighboring equilibrium states. The loading exerted by the elastic medium on the shell in the deformed state is found by solving an associated boundary value problem of the linearized theory of elasticity in the presence of initial stress. Expressions are derived which give the critical pressure for the cases of a bonded and a smooth interface. (Author)

**AD-628 765 Fld. 20/11, 8/11**
**CFSTI Prices: HC $4.00 MF $1.00**
*AGBABIAN-JACOBSEN ASSOCIATES LOS ANGELES CALIF*
**STUDY OF GROUND MOTIONS FOR SIMULATION BY SHOCK TESTING MACHINE.**
Final rept.,
by Lydik S. Jacobsen, John Karagozian, and James A. Malthan. Nov 65, 139p. Rept. no. AJA-6524, Contract NBy-62198,

Unclassified report

Descriptors: (*Shock (Mechanics), Seismology), (*Vibrators (Mechanical), Seismology), (*Seismology, Vibrators (Mechanical)), Nu-

clear explosions, Seismic waves, Structures, Vibration, Recording systems

This study was performed in order to obtain criteria for the design of a testing machine that will simulate ground shock. Approximate methods were used in defining the motions encountered during ground shock in representative soil profiles, and the effect of various structures interposed between the free-field and equipment was estimated. Shock spectra were then obtained for typical equipment located in various types of structures placed in the assumed soil conditions. In this manner, a range of values was obtained that defined approximately the shock input and the shock response of equipment, which, it is believed, bounds the shock conditions for specified environments given in the Work Statement. (Author)

**AD-628 790 Fld. 20/11**
**CFSTI Prices: HC $4.00 MF $0.75**
*NEW MEXICO UNIV ALBUQUERQUE BUREAU OF ENGINEERING RESEARCH*
**PRODUCTION AND MEASUREMENT OF A DILATATION LOADING FIELD,**
Technical rept.,
by F. D. Ju, and R. A. Benham. Nov 65, 109p.
Rept. no. TR-ME-17,
Contract AF-AFOSR-568-65, Proj. AF-9782, Task 978201,
AFOSR 65-2676
Unclassified report

Descriptors: (*Fracture (Mechanics), Materials), (*Failure (Mechanics), Materials), Epoxy plastics, Shear stresses, Tensile properties, Loading (Mechanics), Thermal stresses, Hydraulic cylinders, Deformation, Test methods

A model of homogeneous, isotropic material was developed in which pure dilatation could be produced and measured. Essentially, the model is a cube of resin epoxy each face of which is pulled by equal tensile force. The equal tensile forces were produced with a hydraulic triaxial tensile testing machine developed for this project. The states of strain were then measured and recorded. An embedded three-dimensional strain gage rosette was used. Dilatation states were produced to within instrumentation error at a hydraulic pressure of 10 psig and carried through to the maximum level of 60 psig which induced an internal strain of approximately 400 mu in/in. The instrumentation error is estimated to have an accumulative maximum of plus or minus 9 percent. There was also an evaluation of the perturbative effects due to the loading device. Included were alignment perturbation causing additional bending moment in the model and excessive friction in the load cylinder causing unequalization of the triaxial loads. (Author)

**AD-628 796 Fld. 20/11**
**CFSTI Prices: HC $5.00 MF $0.75**
*STANFORD RESEARCH INST MENLO PARK CALIF*
**SHOCK ATTENUATION IN SOLID AND DISTENDED MATERIALS.**
Final rept., 1 Aug 63-1 Nov 65,
by J. R. Rempel, D. N. Schmidt, J. O. Erkman, and W. M. Isbell. Feb 66, 162p. Contract AF 29 (601)-6040, Proj. AF-5710 ,SRI-GSU-4613

WL TR-64-119
Unclassified report

Descriptors: (*Solids, Shock (Mechanics)), (*Foams, Shock (Mechanics)), (*Shock waves, Attenuation), Propagation, Equations of state, Loading (Mechanics), Expanded plastics, Aluminum, Silicon compounds, Dioxides, Beryllium, Graphite, Damping, Isocyonate plastics

Good methods exist to estimate shock response of certain elastic-rigid foams at very high pressures when no forerunner is present, and at very low pressures when no locking wave is present. For the intermediate region of pressure (approximately 0.1 to 6 kbar), when both waves are present and of the same order of magnitude, predictions are less reliable and values forecast of pressure in this region based on general theories are too high. From considerations of pressure wave shape it is believed that this anomaly may be related to the porous nature of the foam. The investigation experimentally measured peak pressures transmitted to a steel wall to about 6 kbar, found conditions for double-wave structure, and observed wave shapes produced by impacts carrying momentum densities in the range 0.6 to 30,000 taps in 0.7 to 1.4 g/cc aluminum, 0.67 g/cc polyurethane, 1.1 g/cc beryllium, 1.1 to 1.7 g/cc graphite, and 1.0 g/cc silica foam. (Author)

**AD-628 855 Fld. 20/11**
**CFSTI Prices: HC $2.60 MF $0.50**
*BROWN UNIV PROVIDENCE R I DIV OF ENGINEERING*
**ELASTIC-PLASTIC CONTINUA CONTAINING UNSTABLE ELEMENTS OBEYING NORMALITY AND CONVEXITY RELATIONS.**
Technical rept.,
by G. Maier, and D. C. Drucker. Nov 65, 23p.
Rept. no. TR-45,
Contract Nonr-562 (20) Proj. NR-064-424,
Unclassified report

Descriptors: (*Structures, Continuum mechanics), (*Continuum mechanics, Structures), Elasticity, Plasticity, Stability, Mathematical analysis, Loading (Mechanics), Deformation

A one- , two- , or three-dimensional continuum is supposed to be composed of stable and unstable elements in the conventional structural sense or on the microscale. The initial and each of the subsequent yield surfaces for each element of a structure, or each point in a continuum, are taken as convex in a generalized or actual stress space. The increments or rates of generalized or actual plastic strain are taken as normal to the current yield surface. Initial and subsequent yield surfaces in load space for the entire body are seen to be convex and the vectors representing the corresponding permanent displacement increments or rates are normal to these surfaces, when the elastic response is unaltered by the deformation or remains linear. The character of the elastic and plastic response up to the point of overall instability is described. Conditions for stability and uniqueness of response are given. (Author)

**AD-628 856 Fld. 20/11, 11/6**
**CFSTI Prices: HC $2.60 MF $0.50**
*BROWN UNIV PROVIDENCE R I DIV OF ENGINEERING*
**ON TIME-INDEPENDENT PLASTICITY AND METALS UNDER COMBINED STRESS AT ELEVATED TEMPERATURE.**
Technical rept.,
by D. C. Drucker. Nov 65, 23p. Rept. no. TR-46,
Contract Nonr-562 (20) Proj. NR-064-424,
Unclassified report

Descriptors: (*Plasticity, Metals), (*Metals, Stresses), Creep, High-temperature research, Strain (Mechanics)

A possible description is proposed for the time- and temperature-dependent behavior of metals under combined stress. The present knowledge of essentially time-independent behavior, embodied in the mathematical theory of plastic stress-strain relations and the associated experimental data, is combined with the knowledge of behavior in simple tension at elevated temperature. This is in the spirit of Odqvist's early approach (1934) which translated Mises' description of isotropic plastic stress-strain relations to a most useful formulation for creep under constant stress. Little relevant experimental data is available as yet to permit evaluation of the proposals which are advanced. Questions are raised to which answers cannot be given now. Part of an experimental program in progress is outlined along with directions for future work. (Author)

**AD-628 279** **See Fld. 13/13**

**AD-628 806** **See Fld. 13/13**

**AD-628 865** **See Fld. 11/6**

## 20/12. SOLID STATE PHYSICS

**AD-628 051 Fld. 20/12, 7/4**
**CFSTI Prices: HC $3.00 MF $0.75**
*MASSACHUSETTS INST OF TECH CAMBRIDGE*
**SOLID-STATE AND MOLECULAR THEORY GROUP.**
Quarterly progress rept. no. 59.
15 Jan 66, 63p. Contract Nonr-1841 (34) ,AF 19 (628)-356
Unclassified report

See also AD-623 886.

Descriptors: (*Solid state physics, Reviews), (*Molecular properties, Reviews), (*Wave functions, Crystals), (*Green's function, Electrons), (*Diamonds, Band theory of solids), (*Symmetry (Crystallography), Harmonic analysis), (*Molecular orbitals, Set theory), (*Set theory, Functions), Gallium, Programming (Computers), Crystal structure, Halogenated hydrocarbons

Contents: Survey; The Solid-State and Molecular Theory Group -- one year report; Wave function in crystalline solids expanded in augmented plane waves, by W. Rudge; Note on the Green's function method, by J. C. Slater; Errata - constant energy surface for gallium; by J. H. Wood; Energy bands in diamond, by J. H. Wood; The cubic harmonics of gamma-1 symmetry, by P. DeCicco and A. Kitz; Non-empirical LCAO-SCF calculations on formyl fluoride with Gaussian type functions: II. Calculations with minimal Gaussian basis set, by I. G. Csizmadia, M. C. Harrison, B. T. Sutcliffe; One-center Slater-eta and multicenter Slater basis sets, by D. Ellis and P. Ros.

**AD-628 116 Fld. 20/12**
**CFSTI Prices: HC $1.60 MF $0.50**
*ILLINOIS UNIV URBANA DEPT OF PHYSICS*
**ELASTIC CENTERS OF STRAIN AND DISLOCATIONS,**
by J. S. Koehler. 1964, 20p.
Unclassified report

Descriptors: (*Elasticity, Mathematical analysis), Strain (Mechanics), Deformation, Solids

It is shown that the displacement fields and the stress fields associated with various dislocation arrangements in an isotropic elastic solid can be easily obtained by integrating the displacements found for various kinds of point nuclei of strain. Examples are given. It is found that a platelike precipitate of centers of dilation is not completely equivalent to an edge dislocation loop. One must include in addition forces acting in the plane of the loop at the edge of the loop. The implications concerning the elastic force acting on point defects near a precipitate are discussed. (Author)

**AD-628 122 Fld. 20/12, 20/3, 20/6**
**CFSTI Prices: HC $1.10 MF $0.50**
*DELAWARE UNIV NEWARK DEPT OF PHYSICS*
**HIGH AMPLITUDE CURRENT AND OPTICAL TRANSMISSION OSCILLATIONS IN CDS SINGLE CRYSTALS.**
Technical rept.,
by Joseph J. Ward. Feb 66, 8p. Rept. no. TR-6,
Contract Nonr-4336 (00) ,DA-31-124-ARO (D)-173
Unclassified report

Descriptors: (*Semiconductors, Physical properties), (*Cadmium compounds, Sulfides), Electric current, Oscillation, Optical properties, Single crystals, Photoconductivity

Low frequency current oscillations with current modulation of two orders of magnitude or more were observed in CdS single crystal platelets under conditions of high electric field and illumination with monochromatic light near the fundamental absorption edge. In conjunction with the current oscillations the optical transmission in the entire region between the electrodes varied almost homogeneously. These new oscillations are observed in certain crystals in which periodic transitions occur between 'n' and 's' shaped negative resistance regimes. The oscillations occur only in crystals whose temperature coefficient of photoconductivity is positive, followed by a negative region at increased temperature and only if the temperature without field was in the region of positive coefficient. The observed frequencies of oscillations were in the range from 0.1 to 5.0 cps, increasing with increasing light intensity and voltage.

**AD-628 190 Fld. 20/12, 11/6**
**CFSTI Prices: HC $1.10 MF $0.50**
*BROWN UNIV PROVIDENCE R I METALS RESEARCH LAB*
**QUARTERLY REPORT,**
by Bruce B. Chick, George P. Anderson, and Rohn Truell. Jan 66, 6p. Contract NOw-66-0105-d,

Unclassified report

Descriptors: (*Solids, Physical properties), (*Ultrasonic radiation, Solids), Sensitivity, Nondestructive testing, Materials

**AD-628 321 Fld. 20/12, 20/3**
**CFSTI Prices: HC $3.00 MF $0.75**
*TECHNION - ISRAEL INST OF TECH HAIFA*
**ELECTRICAL PROPERTIES OF TRANSITION METAL OXIDES UP TO 1800C.**
Interim scientific rept. no. 1, 1 Aug 64-30 Sep 65, by D. S. Tannhauser. 11 Nov 65, 73p. Contract AF 61 (052)-825, ARL 66-0020

Unclassified report

Descriptors: (*Transition elements, Oxides), (*Cobalt compounds, Electrical properties), (*Manganese compounds, Electrical properties), (*Thermoelectricity, Oxides), Electrical conductance, Power, Crystal lattice defects, Carriers (Semiconductors), Phase studies, Seebeck effect, Israel

Electrical conductivity, thermoelectric power and deviation from stoichiometry of CoO was measured in the range 1000-1450C. The results are discussed in terms of defect concentrations, ionization energies and charge carrier mobility. Similar measurements on MnO are in progress and are reported in a provisional form. The phase diagram of both materials is a by-product of this work and is reported. (Author)

**AD-628 346 Fld. 20/12, 7/4, 20/3**
*NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE*
**OPTICAL ZEEMAN EFFECT IN THE R1 AND R2 LINES OF MN (4+) IN A1203,**
by M. H. Crozier. 19 Jul 65, 4p. Contract AF 49(638)-1468, AFOSR 65-2555

Unclassified report

*Availability: Published in Physics Letters, v18 n3 p219-20 Sep 1 1965. Copies to DDC users only.*

Descriptors: (*Manganese, Line spectrum), (*Paramagnetic resonance, Manganese), (*Aluminum compounds, Oxides), Single crystals, Impurities, Ions, Luminescence, Magnetic fields, Atomic energy levels, Optical phenomena

**AD-628 363 Fld. 20/12, 7/4, 20/2**
*HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF PHYSICS*
**PARAMAGNETIC RESONANCE OF YB (3+) IN CAWO4,**
by V. Volterra, and U. Ranon. 31 Jan 64, 3p. Contract AF-EOAR-63-64, AFOSR 65-2544

Unclassified report

Prepared in cooperation with Soreq Research Establishment, Israel Atomic Energy Commission, Yavne.

*Availability: Published in The Physical Review, v134 n6A pA1483-5 15 Jun 64. Copies to DDC users only.*

Descriptors: (*Ytterbium, Paramagnetic resonance), (*Paramagnetic resonance, Ytterbium), (*Calcium compounds, Tungstates), Single crystals, Impurities, Lasers, Materials, Crystal structure, Israel

Paramagnetic resonance of Yb (3+) was observed in single crystals of CaWO4 at 20K and 3 cm. A tetragonal as well as two rhombic spectra were found. The spectra arise from Yb (3+) ions at Ca (2+) sites and the rhombic symmetry is caused by charge compensation at next-nearest-neighbor Ca (2+) sites. The possibility of W (6+) substitution is discussed. (Author)

**AD-628 401 Fld. 20/12**
**CFSTI Prices: HC $2.60 MF $0.50**
*SOREQ RESEARCH ESTABLISHMENT ISRAEL ATOMIC ENERGY COMMISSION YAVNEH*
**THE GROUND STATES AND RELATIVE STARK SPLITTINGS OF SOME TRIVALENT RARE EARTH IONS IN THE CUBIC CRYSTAL FIELD OF CALCIUM FLUORIDE,**
by U. Ranon. May 64, 26p. Rept. no. IA-897, Contract AF-AFOSR-63-64, AFOSR 65-2305

Unclassified report

Descriptors: (*Rare earth elements, Atomic energy levels), (*Calcium compounds, Fluorides), (*Atomic energy levels, Rare earth elements), (*Stark effect, Rare earth elements), Crystal lattices, Impurities, Electron spin resonance, Praseodymium, Neodymium, Promethium, Terbium, Pysprosium, Holmium, Erbium, Thulium, Ytterbium, Israel

The ratios B4/B6 of the cubic crystal field parameters are calculated from electron spin resonance on CaF2:Nd (3+) and CaF2:Dy (3+), and the results are used to show that the ratio A4/A6 is not constant, as required by the point charge model. A linear expression of A4/A6 as a function of Z is constructed from the available data. The integrals <r4> and <r6> of Freeman and Watson are used in deducing Br/B6 for the trivalent rare earth ions. Eigenfunctions and eigenvalues of Lea, Leask and Wolf are employed in deducing the ground states and relative Stark splittings of the rare earth ions. The ground states are: Pr (3+) (gamma-5); Nd (3+) (gamma-8); Pm (3+) (gamma-1); Tb (3+) (gamma-3); Dy (3+) (Gamma-8); Ho (3+) (gamma-3); Er (3+) (gamma-7); Tm (3+) (gamma-2); Yb (3+) (gamma-7). Optical spectra are discussed. (Author)

**AD-628 404 Fld. 20/12**
*COLUMBIA UNIV NEW YORK*
**INTERACTION STRESSES OF EDGE DISLOCATIONS WITH OBSTACLES IN A DISCRETE CRYSTAL MODEL.**
Revised ed.,
by Hamilton Southworth Jr.. 29 Apr 65, 24p. Contract AF-AFOSR-228-63, AFOSR 65-2556

Unclassified report

Revision of manuscript submitted 5 Jan 65.

*Availability: Published in The Journal of Physics and Chemistry of Solids, v26 p1649-71 1965. Copies to DDC users only.*

Descriptors: (*Crystal lattices, Theory), (*Crystal lattice defects, Stresses), Models (Simulations), Continuum mechanics, Surfaces, Elasticity, Shear stresses, Impurities

New types of behavior found in the discrete analysis which have no continuum counterparts include the following: (1) The discrete dislocation has a non-zero width which changes with interaction geometry. The dislocation widens when the rate of change of interaction stress with decreasing slip plane obstacle distance is negative. When the rate of change is positive the dislocation is found to narrow. (2) The discrete theory allows interaction stress calculations which include the Peierls stress. (3) A critical separation distance between two dislocations of opposite sign on the same slip plane exists where only the critical shear stress for the perfect lattice would prevent their mutual annihilation. This differs little from the dislocation vs. free surface interaction. (4) For a dislocation versus a similar dislocation on the same slip plane a certain separation distance is found that cannot be minimized by a uniform shear stress less than the critical shear stress for the perfect lattice. (Author)

**AD-628 424 Fld. 20/12, 11/2**
*COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION SYDNEY (AUSTRALIA) DIV OF PHYSICS*
**THERMAL PROPERTIES OF SILICA AT LOW TEMPERATURES,**
by G. K. White, and J. A. Birch. 1964, 6p. Contract AF-AFOSR-62-391, AFOSR 65-2558

Unclassified report

*Availability: Published in Physics and Chemistry of Glasses, v6 n3 p85-9 Jun 1965. Copies to DDC users only.*

Descriptors: (*Silicon compounds, Thermal properties), (*Glass, Thermal properties), Dioxides, Lowtemperature research, Thermal expansion, Neutron reactions, Density, Specific heat, Vibration, Quartz, Australia

At temperatures below 20K the magnitude of the negative thermal expansion of vitreous silica is reduced by about 10% with increase in fictive temperature from 1000 to 1400C. A much greater reduction of 2 to 4 times is produced by fast neutron irradiation. Corresponding changes in density and the heat capacity (observed atlow temperatures) also occur. The negative expansion and other 'anomalous' properties appear to have a common origin in view of the parallel changes in these properties which occur with heat treatment, irradiation, and network-filling additives. Low-frequency transverse optical modes of vibration seem to be responsible but it is puzzling that the anomalous behaviour persists at such low temperatures (about 2K). (Author)

**AD-628 437 Fld. 20/12, 20/3**
*BATTELLE MEMORIAL INST COLUMBUS OHIO*
**CONDUCTION ELECTRON SCATTERING BY IONIZED DONORS IN INSB AT 80K,**
by R. T. Bate, R. D. Baxter, F. J. Reid, and A. C. Beer. 9 Feb 65, 13p. Contract AF-AFOSR-525-64, Proj. AF-9761, Task 976102, AFOSR 65-2105

Unclassified report

*Availability: Published in Journal of Physics and Chemistry of Solids v26 p1205-14 1965. Copies to DDC users only.*

Descriptors: (*Carriers (Semiconductors), Transport properties), (*Indium alloys, Antimony alloys), Electrons, Scattering, Electrical conductance, Cryogenics, Band theory of solids, Hall effect, Resistance (Electrical)

Electron mobility data obtained from Hall effect and resistivity measurements at 80K on samples of InSb containing 10 to the 15th power to 3 x 10 to the 17th power ionized donors per cc are reported and analyzed. The dominant scattering mechanism is that by ionized impurities, and theoretical results are corrected for electron-electron collision and band nonparabolicity. The Kane model for the conduction band is employed, neglecting perturbations from bands other than the conduction and valence bands. The non-parabolic band shape is found to have a strong influence on the mobility at higher carrier concentrations. Approximate calculations are also made of the contribution of polar scattering as modified by the electron-electron collisions. Combination of the two mechanisms accounts fairly well for the observations measured as a function of impurity concentration. (Author)

**AD-628 445 Fld. 20/12**
*UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF PHYSICS*
**THEORY OF PHONON-ASSISTED TUNNELING IN SEMICONDUCTORS,**
by Leonard Kleinman. 30 Nov 64. 12p. Contract AF-AFOSR-496-64, AFOSR 65-2734

Unclassified report

*Availability: Published in The Physical Review, v140 n2A pA637-48 Oct 18 1965. Copies to DDC users only.*

Descriptors: (*Tunneling (Electronics), Semiconductors), (*Phonons, Tunneling (Electronics)), Electric fields, Band theory of solids, Wave functions, Operators (Mathematics), Matrix algebra

The phonon-assisted tunneling current is calculated for a model p-n junction (as opposed to the homogeneous-electric-field model) due to two mechanisms. A first-order mechanism in which an electron on, say, the p side scatters to a state on the n side with the emission of a phonon yields results similar to those calculated by other workers for the homogeneous electric field model and is about three orders of magnitude too small to account for the experimentally observed current. A second-order process in which an electron on the p side tunnels to an intermediate state in a higher band on the n side via the interband term in the Hamiltonian and then scatters with the emission of a phonon to a final state on the n side yields a current equal in magnitude to the experimentally observed current. This mechanism also succeeds, where the first one fails, in accounting for the magnitude of an differences between the experimentally measured pressure coefficients.

**AD-628 453 Fld. 20/12, 20/2, 20/6**
**CFSTI Prices: HC $1.10 MF $0.50**
*DELAWARE UNIV NEWARK DEPT OF PHYSICS*
**HIGH AMPLITUDE CURRENT AND OPTICAL TRANSMISSION OSCILLATIONS IN CDS SINGLE CRYSTALS.**
Technical rept.,
by Joseph J. Ward. Feb 66, 9p. Rept. no. TR-5, Contract DA-31-124-ARO (D)-173, AROD 4461:5

Unclassified report

Descriptors: (*Semiconductors, Electric currents), (*Cadmium compounds, Sulfides), (*Single crystals, Optical properties), Electric fields, Modulation, Illumination, Light transmission, Photoconductivity, Monochromatic light, Intensity, Voltage, Oscillation, Temperature

Low frequency current oscillations with current modulation of two orders of magnitude or more have been observed in CdS single crystal platelets under conditions of high electric field and illumination with monochromatic light near the fundamental absorption edge. The observed frequencies of oscillations were in the range from 0.1 to 5.0 cps, increasing with increasing light intensity and voltage. For most crystals the temperature of maximum photoconductivity occurred at approximately 130K. Oscillations for these crystals were observed only if the temperature without field was below 120K. Only certain kinds of crystals exhibited the above described oscillations. Besides the temperature dependence of the photoconductivity, these crystals show a pronounced thermally stimulated current (conductivity glow)-peak at 280K, and those which oscillate only at the lower temperature show another peak at 140K. (Extracted)

**AD-628 455 Fld. 20/12, 20/2, 7/2**
*TEXAS UNIV AUSTIN DEPT OF CHEMICAL ENGINEERING*
**THE PHASE EQUILIBRIA AND CRYSTAL CHEMISTRY OF THE RARE EARTH GROUP VI SYSTEMS. III. NEODYMIUM-TELLURIUM,**
by W. Lin, H. Steinfink, and E. J. Weiss. 30 Nov 64. 5p. Contract AF-AFOSR-806-65, AFOSR 65-2539

Unclassified report

See also AD-622 647.

*Availability: Published in Inorganic Chemistry, v4 n6 p877-81 Jun 1965. Copies to DDC users only.*

Descriptors: (*Rare earth elements, Crystallography), (*Neodymium, Phase studies), (*Tellurium, Phase studies), Neodymium compounds, Tellurides, Solid solutions, Crystal structure, Crystal lattices, Thermodynamics

The phases occurring in the neodymium-tellurium system are: NdTe, f.c.c. a=6.278 A., m.p. 2040C. A solid solution series Nd3Te4-Nd2Te3 which has a high temperature, Th3P4-type structure, whose cubic lattice constant varies from 9.434 to 9.424 A., respectively; a phase transition occurs at 1000C to an orthorhombic modification, Pbnm, a =11.94 A., b = 12.24 A., c=4.407A.; Nd3Te4 melts at 1680C and Nd2Te3 melts at 1620C. A solid solution series exists over the composition range NdTe1.74 to NdTe2; the tetragonal unit cell for NdTe2 has dimensions a = 4.419 A., c = 9.021 A., space group P 4/n mm, and the compound melts at 1270C. The phase Nd2Te5 is orthorhombic, pseudotetragonal, a = b = 4.380 A., c = 44.0 A., space group Bmmb, and melts incongruently at 910C. NdTe3 is orthorhombic, Bmmb, and the dimensions of the Pseudotetragonal cell are a = 4.350 A., c = 25.8 A. The compound melts incongruently at 830C. (Author)

**AD-628 519 Fld. 20/12, 20/6, 20/10**
*BRITISH COLUMBIA UNIV VANCOUVER DEPT OF PHYSICS*
**PHONON BROADENING OF IMPURITY SPECTRAL LINES. III. DIAGRAM TECHNIQUE,**
by Robert Barrie, and R. G. Rystephanick. 19 May 65. 30p.

Unclassified report

*Availability: Published in Canadian Journal of Physics v44 p109-38 1966. Copies to DDC users only.*

Descriptors: (*Semiconductors, Impurities), (*Impurities, Line spectrum), (*Line spectrum, Phonons), (*Phonons, Line spectrum), Absorption spectrum, Graphics, Quantum mechanics, Green's function, Electrons

The theory of the phonon broadening of optical absorption lines associated with impurities in semiconductors is discussed, using the diagram technique for the evaluation of an appropriate two-particle temperature Green's function. The single-particle propagator for an electron moving in the impurity potential and simultaneously in interaction with the phonons is calculated and used. The interaction with the phonons is treated as weak. The line-shape function is found, and a comparison is made between this method of calculation and a previous one based on the decoupling of an infinite hierarchy of equations for double-time temperature-dependent Green's functions. (Author)

**AD-628 605 Fld. 20/12**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J*
**ALLOY JUNCTION FORMATION TEMPERATURE AND ELECTRO-LUMINESCENCE IN 4TH SILICON CARBIDE,**
by B. Franklin Frowner, and I. N. Greenberg. 4 Oct 65. 1p.

Unclassified report

*Availability: Published in Applied Physics Letters, v7 n9 p243 Nov 1 1965. Copies to DDC users only.*

Descriptors: (*Electroluminescence, Semiconductors), (*Semiconductors, Electroluminescence), (*Silicon alloys, Carbon alloys), Spectra (Visible + ultraviolet), Diodes (Semiconductor)

The spectral characteristics of the electroluminescence from forward-biased 4H SiC p-p alloy junctions as a function of the temperature of junction formation, T sub f were investigated. Junctions formed at 2200C exhibit a blue-violet spectrum which has not yet been reported in SiC electroluminescence.

**AD-628 606 Fld. 20/12, 20/3**
*ARMY ELECTRONICS LABS FORT MONMOUTH N J*
**PRESSURE DEPENDENCE OF THE DIELECTRIC CONSTANT OF STRONTIUM TITANATE,**
by G. A. Samara, and A. A. Giardini. 15 Jun 65. 4p.

Unclassified report

*Availability: Published in The Physical Review, v140 n3A pA954-7 Nov 1 1965. Copies to DDC users only.*

Descriptors: (*Strontium compounds, Titanates), (*Titanates, Dielectric properties), (*Dielectric properties, Pressure), Low frequency, Infrared radiation, Polarization, Refractive index, Single crystals

The effect of pressure, up to 50 kbar, on the low-frequency dielectric constant of SrTiO3 was measured at 25C. The dielectric constant decreases with increasing pressure. From the present data and the known values of the compressibility and the initial change of the refractive index with pressure, it is shown that the variation of the infrared polarizability with pressure is the predominant factor in determining the change of the dielectric constant. This result is discussed in terms of Cochran's theory which associates the large value of the constant with a low-frequency transverse optic mode of vibration. (Author)

**AD-628 608 Fld. 20/12, 20/3**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J*
**COMMENTS ON 'NERNST EFFECT IN INDIUM ANTIMONIDE',**
by Herbert Mette, and Claire Loscoe. 15 Feb 65. 1p.

Unclassified report

*Availability: Published in Journal of Applied Physics, v36 n9 p2970 Sep 1965. Copies to DDC users only.*

Descriptors: (*Indium compounds, Antimonides), (*Semiconductors, Magnetic properties), Theory, Magnetic fields, Thermal properties

It is postulated that the reason that the results of measurements of the Nerst effect in indium antimonide reported by M. R. El-Saden and F. W. Thomas (J. Appl. Phys., v36, p181, 1965) do agree well with theory are: (1) failure to exclude the possibility of errors due to the Righi-Leduc effect; and (2) use of low-field theory treatment of data at fields high enough to be subjected to a considerable magnetoeffect.

**AD-628 632 Fld. 20/12, 20/2**
*MANLABS INC CAMBRIDGE MASS*
**THE PREPARATION AND STRUCTURE OF THIN FILMS OF BORON ON SILICON.**
Physical sciences research papers,
by Edward T. Peters, and William D. Potter. Nov 65, 12p. Contract AF 19(628)-2438, Proj. AF-5620, Task 562004,
AFCRL 65-852 ,PSRP-168

Unclassified report

*Availability: Published in The Transactions of the Metallurgical Society of AIME, v233 p473-7 Mar 1965. Copies to DDC users only.*

Descriptors: (*Semiconducting films, Preparation), (*Boron, Semiconducting films), (*Crystal structure, Boron), (*Vapor plating, Boron), Single crystals, Films, Silicon, Chlorides, Boron compounds, Microstructure, Electron diffraction

Single-crystal films of boron were prepared by thermal reduction of purified BCl3 with subsequent deposition of boron onto oriented silicon substrates. The structural properties of films prepared under various experimental conditions were determined by light microscopy and 'grazing' angle electron-diffraction analysis. An orientation relationship is proposed for silicon and alpha rhombohedral boron. (Author)

**AD-628 634 Fld. 20/12, 20/3**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS*
**AN ANOMALY IN THE RESISTIVITY-TEMPERATURE PROFILE OF ULTRAPURE PHENANTHRENE.**
Physical sciences research papers,
by Paul A. Andrews, Alton F. Armington, and Bernard Rubin. 24 Mar 65, 11p. Rept. no. AFCRL-PSRP-180 ,AFCRL-65-897
Proj. AF-5620, Task 562004,

Unclassified report

*Availability: Published in Applied Physics Letters, v7 n4 p86-8 Aug 15 1965. Copies to DDC users only.*

Descriptors: (*Semiconductors, Phenanthrenes), (*Phenanthrenes, Resistance (Electrical)), Thermal properties, Impurities, Crystal lattice defects, Crystal structure, Transformations, Diffusion, Electrical conductance

Phenanthrene was purified by zone-refining methods and the resistivity of the material was determined as a function of temperature. A discontinuity in the resistivity temperature curve was observed at about 68C and this discontinuity was intensified in the purer portions of the material. Various possible explanations are discussed. (Author)

**AD-628 728 Fld. 20/12, 20/13, 20/3**
*THOMAS J WATSON RESEARCH CENTER YORKTOWN HEIGHTS N Y*
**SPECIFIC-HEAT SINGULARITY IN MNF2,**
by Dale T. Teaney. 23 Apr 65, 5p. Contract AF 49(638)-1379, Proj. AF-9763 Task 976303,
AFOSR 65-2580

Unclassified report

*Availability: Published in Physical Review Letters, v14 n22 p898-900 May 31 1965. Copies to DDC users only.*

Descriptors: (*Magnetic materials, Specific heat), (*Specific heat, Manganese compounds), (*Manganese compounds, Fluorides), Transport properties, Single crystals

Measurements are reported of the specific heat of a classic magnetic system, MnF2. The results demonstrate clearly the essential similarity between magnetic and gaseous systems and are in encouragingly good agreement with theoretical predictions, especially with respect to the strength of the singularity.

**AD-628 742 Fld. 20/12, 20/13**
*MICHIGAN STATE UNIV EAST LANSING*
**SPECIFIC HEAT OF FE3 (PO4)2.8H20,**
by H. Forstat, N. D. Love, and J. McElearney. 10 Mar 65, 5p. Contract AF-AFOSR-430-63, Proj. AF-9763, Task 976303,
AFOSR 65-2572

Unclassified report

*Availability: Published in Physical Review, v139 n4A pA1246-8 Aug 16 1965. Copies to DDC users only.*

Descriptors: (*Magnetic materials, Specific heat), (*Specific heat, Iron compounds), (*Iron compounds, Phosphates), Single crystals, Hydrates, Cryogenics, Paramagnetism, Antiferromagnetism, Transformations, Crystal lattices, Entropy, Field theory, Integrals

Specific-heat measurements have been made on a single crystal of Fe3 (PO4)2.8H2O in the temperature range 1.8-25K. Two lamda-type anomalies were observed at 9.60 and 12.40K and are associated with paramagnetic -antiferromagnetic transitions. The six iron ions per unit cell are not equivalent, giving rise to a two-step antiferromagnetic transition as observed in the two anomalies, and indicating a ratio of 2 for the entropy changes associated with the two sets of nonequivalent ions. The total entropy change associated with these transitions is 9.58 cal/mole deg, which differs by 1% from 3R ln (2S + 1), where S = 2 for Fe (++), with approximately 27% of this entropy gained above 12.40K. By using the simple molecular-field theory, an estimate of the magnitude of the exchange integral was obtained as well as the temperature dependence of the sublattice magnetization. (Author)

**AD-628 770 Fld. 20/12, 9/1**
**CFSTI Prices: HC $4.60 MF $0.50**
*GENERAL ELECTRIC CO SCHENECTADY N Y RESEARCH AND DEVELOPMENT CENTER*
**NEW SOLID-STATE DEVICE CONCEPTS.**
Scientific rept.,
by M. Aven, R. N. Hall, L. M. Rosenberg, and H. H. Woodbury. Dec 65, 42p. Rept. no. Scientific-3,65-GC-0319
Contract AF 19(628)-4976, Proj. AF-4608, Task 460805,
AFCRL 65-896

Unclassified report

See also AD 621 941.

Descriptors: (*Semiconductor devices, Materials), (*Lasers, Semiconductor devices), Semiconductors, Cadmium compounds, Sulfides, Doping, Selenium, Diffusion, Tracer studies, Zinc alloys, Selenium alloys, Tellurium alloys, Transport properties, Electroluminescence, Semiconducting films, Gallium alloys, Arsenic alloys, Optical properties, Electronic switching, Diodes (Semiconductor)

Data on the diffusion of Se into CdS as functions of time and sulfur pressure between 900 and 1000C show that the diffusion profiles are independent of predoping with Se, preannealing the crystals, surface preparation, and In doping. The diffusion is not simple, and the data are being analyzed to determine a suitable model. A successful new technique for growing ZnSe sub x,Te sub (1-x) crystals is described, and data on the properties of junctions prepared from a new composition corresponding to x = 0.14 are given. Light intensity vs current and temperature are given and discussed in terms of a proposed energy level diagram. Thin-film GaAs switching diodes have been constructed by evaporation of Ga and As onto Mo substrates. The characteristics resemble those described by Mizushima except that they are asymmetrical with respect to voltage. (Author)

**AD-628 793 Fld. 20/12, 7/4, 20/2**
**CFSTI Prices: HC $2.60 MF $0.50**
*LITTLE (ARTHUR D) INC CAMBRIDGE MASS*
**TEMPERATURE DEPENDENCE OF THE INFRARED SPECTRA OF SELECTED DIELECTRICS II.**
Final rept. Jan-Nov 65,
by O. M. Clark. 30 Nov 65, 26p. Rept. no. 66698,
Contract AF 19(628)-4351, Proj. AF-5621, Task 562105,
AFCRL 66-20

Unclassified report

Descriptors: (*Dielectrics, Spectra (Infrared)), Temperature, Lithium compounds, Fluorides, Magnesium compounds, Oxides, Crystals, Quartz, Dielectric properties, Reflection, Measurement

The damping constant as a function of temperature was compared with theoretical equation and showed agreement at high temperature but deviated from the equation at low temperature. A dispersion analysis for LiF and MgO was performed. The calculations show that in order to have a satisfactory fit between the experimental and calculated value of reflectivity one must assume that the high frequency dielectric constant is a function of temperature. The infrared spectra of alpha-quartz was measured as a function of temperature with polarized light. It was observed that the infrared bands shift to longer wave length as the lattice expands. (Author)

**AD-628 822 Fld. 20/12**
*CALIFORNIA UNIV LA JOLLA*
**SOME NEW SUPERCONDUCTING COMPOUNDS,**
by D. C. Hamilton, J. Raub, B. T. Matthias, E. Corenzwit, and G. W. Hull,Jr.. 28 Aug 64, 5p.
Contract AF-AFOSR-631-64,
AFOSR 65-2936

Unclassified report

*Availability: Published in The Journal of Physics and Chemistry of Solids, v26 p665-7 1965. Copies to DDC users only.*

Descriptors: (*Superconductors, Intermetallic compounds), (*Intermetallic compounds, Superconductors), Gold alloys, Aluminum alloys, Barium alloys, Calcium alloys, Gallium alloys, Indium alloys, Lead alloys, Tin alloys, Lanthanum compounds, Platinum alloys, Iridium alloys, Superconductivity, Cryogenics

Superconductivity has previously been observed in pure iridium and in platinum-rich solid solutions, and it has previously been suggested that pure platinum may be superconducting at sufficiently low temperatures. A report is made of the superconductivity of some intermetallic compounds, eight of which contain appreciable amounts of gold. The superconducting behavior of the compounds gives information about the pure element. Superconductivity in the noble elements may extend from iridium through platinum even as far as gold. (Author)

**AD-628 870 Fld. 20/12**
**CFSTI Prices: HC $3.60 MF $0.50**
*NAVAL RESEARCH LAB WASHINGTON D C*
**DETECTOR INVESTIGATION FOR 8-15 AND 100-4000 MICRON REGIONS.**
Semiannual technical summary rept. no. 18, 1 Jul31 Dec 65,
by R. F. Wallis, and H. Shenker. Feb 66, 31p.
Rept. no. NRL-MR-1673,
Unclassified report

Descriptors: (*Detectors, Semiconductors), (*Semiconductors, Detectors), Germanium, Indium alloys, Antimony alloys, Infrared detectors, Absorption spectrum

**AD-628 089** **See Fld. 7/4**

**AD-628 338** **See Fld. 20/3**

**AD-628 394** **See Fld. 20/6**

**AD-628 434** **See Fld. 20/3**

**AD-628 450** **See Fld. 9/1**

**AD-628 560** **See Fld. 20/5**

**AD-628 610** **See Fld. 11/2**

**AD-628 858** **See Fld. 9/5**

## 20/13. THERMODYNAMICS

**AD-628 423 Fld. 20/13**
*COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION SYDNEY (AUSTRALIA) DIV OF PHYSICS*
**THERMAL EXPANSION OF GERMANIUM AND SILICON AT LOW TEMPERATURES.**
by R. H. Carr, R. D. McCammon, and G. K. White. 23 Dec 64, 7p. Contract AF-AFOSR-62-391,
AFOSR 65-2557
Unclassified report

*Availability: Published in Philosophical Magazine, v12 n115 p157-63 Jul 1965. Copies to DDC users only.*

Descriptors: (*Thermal expansion, Low-temperature research), (*Germanium, Thermal expansion), (*Silicon, Thermal expansion), Crystal lattices, Semiconductors, Australia

The linear expansion coefficients (alpha) of silicon and germanium are reported at temperatures down tp ca. theta/50. At temperatures below 16K, the expansion coefficients are very small but are positive and hence the Gruneisen parameter g is positive. At T = theta/15, g has a minimum value of -0.1 for germanium and -0.42 for silicon. At higher temperatures alpha and g become positive and agree with data of Gibbons. Individual g-values for the transverse acoustic modes must be reduced considerably by dispersion to account for the deep minimum in g (T). (Author)

**AD-628 547 Fld. 20/13, 20/4, 22/3**
**CFSTI Prices: HC $5.60 MF $0.75**
*MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB*
**RADIATION EFFECTS IN THE STAGNATION REGION BOUNDARY LAYER.**
Technical rept.,
by Joseph Shwartz. Nov 65, 56p. Rept. no. TR-119,
Contract AF-AFOSR-62-407,AF-AFOSR-641-64 Proj. AF-9781, Task 978102,
AFOSR 66-0129
Unclassified report

Descriptors: (*Boundary layer, Radiation (Heat transfer)), (*Radiation (Heat transfer), Boundary layer), (*Stagnation point, Boundary layer), Blunt bodies, Atmosphere entry, Fluid mechanics, Thermodynamics

The radiation coupled boundary layer of an emitting and absorbing gas at the stagnation region of a blunt body is considered. Solutions are obtained for a wide range of optical thicknesses and radiation intensities, including the radiative effects of the adjoining shock layer. The solutions indicate the decrease in temperatures, their gradients, and the related conductive heat transfer to the wall as well as the net radiant energy contribution. The results are shown for a range of optical thicknesses from thin to effectively thick, with the major effects of radiation found to exist for the former extreme. (Author)

**AD-628 586 Fld. 20/13**
**CFSTI Prices: HC $0.45 MF $0.75**
*NATIONAL BUREAU OF STANDARDS WASHINGTON D C*
**PROCEDURES FOR PRECISE DETERMINATION OF THERMAL RADIATION PROPERTIES, NOVEMBER 1963 TO OCTOBER 1964.**
Technical note,
by Joseph C. Richmond, S. Thomas Dunn, David P.DeWitt, and Warren D. Hayes,Jr.. 17 Dec 65, 77p. Rept. no. NBS TN-267,
Contract AF 33 (615)-64-1005, Proj. AF-7381, Task DO-738103,
Unclassified report

Descriptors: (*Thermal properties, Measurement), (*Reflectometers, Lasers), High temperature research, Emissivity, Infrared radiation, Thermal radiation

A laser-source integrating sphere reflectometer was designed and built to measure the reflectance of specimens at high temperatures. The sphere was calibrated for linearity of response of 0.632 microns by means of a shallow cylindrical cavity with a variable depth-toradius ratio, having a lining of known reflectance. Preliminary tests showed that the flux emitted by a hot specimen at temperatures up to 2500 K will not invalidate the reflectance measurement. An ellipsoidal mirror reflectometer was calibrated for all known errors in the 1 to 7.5 microns range. A preliminary analysis indicates that the errors in measurement of absolute reflectance with this equipment should not exceed 2 percent. A review of the literature on relation of thermal radiation properties to other properties of materials is presented, together with a summary of the work done in an effort to compute the spectral emittance of rhodium. (Author)

**AD-628 233** **See Fld. 20/4**

**AD-628 258** **See Fld. 20/11**

**AD-628 317** **See Fld. 20/9**

**AD-628 344** **See Fld. 20/3**

**AD-628 351** **See Fld. 7/4**

**AD-628 582** **See Fld. 12/1**

**AD-628 613** **See Fld. 20/9**

**AD-628 657** **See Fld. 20/6**

**AD-628 728** **See Fld. 20/12**

**AD-628 742** **See Fld. 20/12**

## 20/14. WAVE PROPAGATION

**AD-628 056 Fld. 20/14, 3/2, 4/1**
**CFSTI Prices: HC $1.00 MF $0.50**
*AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SPACE PHYSICS LAB*
**SATELLITE SCINTILLATIONS OBSERVED DURING THE JULY 1963 SOLAR ECLIPSE.**
Environmental research papers,
by J. P. Mullen, J. Aarons, and J. M. Mott. Dec 65, 16p. Rept. no. ERP-163,
Proj. AF-4643, Task 464302,
AFCRL 65-914
Unclassified report

Descriptors: (*Satellites (Artificial), Radio transmission), (*Scintillation, Radio transmission), (*Radiofrequency interference, Solar eclipses), (*Solar eclipses, Radiofrequency interference), Radio waves, Ionospheric propagation, Ionospheric disturbances, Atmospheric refraction, Radio astronomy

During the solar eclipse of July 1963, observations of Transit 4A (1961 Omicron) were made for a period of three weeks at a site instrumented near Montreal, P. Q. When the results were correlated with those obtained at the Sagamore Hill Radio Observatory, Hamilton, Mass., it was found that the eclipse had no measurable effect on the scintillation pattern, confirming radio star observations at Sagamore Hill. Two examples of 'cloud' scintillation are described. (Author)

**AD-628 178 Fld. 20/14**
**CFSTI PricesMF $0.50**
*CENTRAL RADIO PROPAGATION LAB NATIONAL BUREAU OF STANDARDS BOULDER COLO*
**COMPUTATIONS OF THE ANTENNA CUTBACK FACTOR FOR LF RADIO WAVES.**
Technical note,
by Duane C. Hyovalti. 26 Nov 65, 48p. Contract AF 30 (602)-2488,
NBS TN-330
Unclassified report

*Availability: Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.30 as GPO-513.46:330.*

Descriptors: (*Ionospheric propagation, Low frequency), Antenna radiation patterns, Radio waves, Electrical conductance, Dielectric properties

There are several methods for evaluating the cutback factor of geometric optics, e. g., the flat-earth approximation, the contour integral, and the residue series summation methods. Wait and Conda give quite extensive details of the theory of these three methods in their 1958 paper, and Johler (1961, 1962) elaborates even further. In this paper each of the above mentioned methods is investigated, and calculations are made for various frequencies and distances. The frequencies used are primarily LF; however, frequencies up to 1 Mc/s are considered. Several conductivities and dielectric constants are used, varying from sea water to typical earth. The permittivity lapse factor is varied from 0.75 to 1.0 with most of the computations being done for 0.75 and 0.85. Only calculations for vertical electric polarization were carried out. (Author)

**AD-628 200 Fld. 20/14, 4/2, 17/9, 20/5**
**CFSTI Prices: HC $3.00 MF $0.75**
*LINCOLN LAB MASS INST OF TECH LEXINGTON*
**SCATTERING AND ATTENUATION BY PRECIPITATION PARTICLES.**
Library reference,
by Carol A. Boudreau, and Melvin L. Stone. 11 Aug 65, 72p. Rept. no. Ref Bib-26,
Contract AF 19 (628)-5167, Proj. AF-649L
ESD TDR-65-598
Unclassified report

Descriptors: (*Radar signals, Scattering), (*Lasers, Scattering), (*Atmospheric precipitation, Interference), (*Meteorological radar, Bibliographies), Radar interference, Optical phenomena, Attenuation, Microwaves, Propagation, Clouds, Fog, Thermal radiation, Dielectrics, Particles

This bibliography is offered to encourage the further application of radar meteorological techniques and data in connection with the study of the effects of hydrometeors, precipitation, clouds and fog on microwave propagation. It combines material de-

veloped in regard to weather radar research with the more conventional works on attenuation. In addition to the weather radar material, the bibliography includes references on thermal radiation from precipitation, cloud physics, and dielectric and scattering properties of hydrometeors. Some of the references are pertinent to the study of propagation at optical wavelengths and are useful in evaluating the performance of laser communications systems. The 494 references included are from the literature published between January 1950 and October 1964.

**AD-628 222 Fld. 20/14, 4/1, 17/2, 22/1**
**CFSTI Prices: HC $12.60 MF $1.00**
*GENERAL ELECTRIC CO SYRACUSE N Y ELECTRONICS LAB*
**SATELLITE-TO-SATELLITE RADIO PROPAGATION EXPERIMENT.**
Final rept., 15 May 62-31 Oct 65,
by Samuel E. Craig. 31 Oct 65, 122p. Contract AF 19 (628)-470, Proj. AF-4603, Task 560307, AFCRL 65-883

Unclassified report

Descriptors: (*Radio transmission, Satellites (Artificial)), (*Satellites (Artificial), Radio transmission), (*Ionospheric propagation, Satellites (Artificial)), Radio signals, Propagation, High frequency, Radio transmitters, Radio receivers, Spaceborne, Telemeter systems, tracking, Ionosphere, Physical properties, Space communication systems

The report describes in detail the preparations for a satellite-to-satellite radio propagation experiment which is intended to study various characteristics of the ionosphere and modes of electromagnetic propagation in the HF region. The experiment consists of a receiver group which is placed in orbit on a suitable satellite vehicle, and a transmitter group which is ejected from the main vehicle in orbit. The transmitting subsatellite gradually separates from the receiving package, and transmits a program of pulse and CW modes to it on two harmonically related frequencies. In addition, two cooperative HF ground stations will receive signals from the transmitting satellite, as well as telemetered data from the receiver group. The details of the payload equipment and ground stations are given in the report, as well as prelaunch checkout procedures and results. (Author)

**AD-628 240 Fld. 20/14**
*CENTRAL RADIO PROPAGATION LAB NATIONAL BUREAU OF STANDARDS BOULDER COLO*
**PROPAGATION OF ELECTROMAGNETIC PULSES IN TERRESTRIAL WAVEGUIDES,**
by James R. Wait. 4 Jun 65, 17p.

Unclassified report

*Availability: Published in IEEE Transactions on Antennas and Propagation vAP13 n6 p904-18 Nov 1965. Copies to DDC users only.*

Descriptors: (*Electromagnetic pulses, Propagation), (*Radio waves, Propagation), Earth (Planet), Ionosphere, Electromagnetic wave reflections, Wave functions

The propagation of electromagnetic waves over the earth's surface is considered under transient conditions. The source is taken to be a vertical electric dipole whose current moment is suddenly established. The build-up of the radiated field is calculated under various assumed conditions. It is shown, even in the absence of an ionospherically reflected wave, that the influence of earth curvature has a pronounced effect on the distortion of the original pulse shape. For great distances (i.e., d>2000 km), it is found to be more convenient to regard the field as a sum of modes. Partiular attention is given to the transient characteristics of the dominant mode as a function of the source waveform. (Author)

**AD-628 468 Fld. 20/14**
*LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS*
**PULSE PROPAGATION IN ANISOTROPIC, RANDOMLY INHOMOGENEOUS MEDIA.**
Revised ed.,
by G. C. Knollman. 2 Aug 65, 12p.

Unclassified report

Revision of manuscript received 10 May 65.

*Availability: Published in Journal of Applied Physics v36 n12 p3704-15 Dec 1965. Copies to DDC users only.*

Descriptors: (*Wave transmission, Electromagnetic pulses), Anisotropy, Refractive index, Perturbation theory, Narrowband, Statistical functions

A theoretical study is conducted of plane-harmonic narrow-band pulse propagation in a statistically uniform but anisotropic transmission medium of weak, stationary refractive-index fluctuation. Large-scale inhomogeneities of arbitrary ellipsoidal shape are treated, with transmitter-to-receiver ranges taken as large compared with the longitudinal correlation length. Of interest in the influence of range, transmitter frequency, and degree of anisotropy on the pulse shape and intensity. Comparison is made between pulse transmission in isotropic and anisotropic random media, and special attention is given the low- and high-frequency limits of the theory as well as certain extreme conditions of anisotropy. The general formulation is applied to the analysis of both an initially Gaussian and an initially rectangular pulse. (Author)

**AD-628 603 Fld. 20/14, 4/1**
*ARMY ELECTRONICS COMMAND FORT MONMOUTH N J INST FOR EXPLORATORY RESEARCH*
**EFFECTS OF PRONOUNCED ELECTRON-CONTENT VARIATIONS ON DOPPLER SHIFT AT LOW ELEVATIONS,**
by Haim Soicher. 1965, 4p.

Unclassified report

*Availability: Published in Nature, v208 n5011 p644-5 Nov 13 1965. Copies to DDC users only.*

Descriptors: (*Doppler effect, Ionosphere), (*Ionosphere, Doppler effect), Electron density, Refractive index, Scintillation, Electromagnetic waves, Radio signals, Scientific satellites

**AD-628 616 Fld. 20/14, 20/9, 17/9**
**CFSTI Prices: HC $2.60 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**SCATTERING OF ELECTROMAGNETIC WAVES IN A SPINOR FORMALISM,**
by R. M. Rockmore. Feb 66, 27p. Rept. no. RM-4865-PR,
Contract AF 49 (638)-1700,

Unclassified report

Descriptors: (*Radar, Backscattering), (*Tensor analysis, Backscattering), Dielectric properties, Plasma medium, Electromagnetic waves, Plasma physics, Refractive index

The scattering of electromagnetic waves by weak scatterers is discussed in terms of a six-component-spinor formulation of the electromagnetic field due to Furutsu and others. Expressions are derived after Glauber for the scattering amplitude which are appropriate to small- and large-angle regimes of high-energy scattering. For the scattering by a homogeneous dielectric sphere, it is seen that the angular distribution given by the Glauber theory is in better agreement with the exact Mie theory than that given by the theory of Saxon and Schiff for values of the refractive index close to one. While both approximations to the exact Mie theory exhibit a displacement of diffraction maxima and minima to larger scattering angles, that displacement is smaller in the Glauber theory. Because of an effective averaging of phase in the Glauber theory at large angles, one finds the minima at very large angles to be washed out. In the asymptotic limit, kR approaches infinity, the radar cross section derived from the Glauber theory is shown to be in order of magnitude agreement with the exact result for an index of refraction in the neighborhood of one. (Author)

**AD-628 737 Fld. 20/14, 12/1**
**CFSTI Prices: HC $4.60 MF $0.50**
*RAND CORP SANTA MONICA CALIF*
**NUMERICAL RESULTS FOR THE ESTIMATION OF SOURCE DISTRIBUTIONS FROM EXTERNAL RADIATION FIELD MEASUREMENTS,**
by R. Bellman, H. Kagiwada, R. Kalaba, and S. Ueno. Feb 66, 42p. Rept. no. RM-4897-PR, Contract AF 49 (638)-1700,

Unclassified report

Descriptors: (*Transport properties, Mathematical models), Field theory, Distribution, Sources, Electromagnetic waves, Neutron flux, Heat transfer, Dynamic programming, Differential equations, Integral equations, Programming (Computers)

A transport process in a slab bounded by two parallel planes is considered. Radiation is both absorbed and scattered isotropically. The radiation is due to continuously distributed internal isotropic sources. The aim is to estimate the distribution of the internal sources based on experimental measurements of the angular dependence of the emergent radiation. First, a system of differential-integral equations for the emergent radiation is deduced. These are approximated by a system of ordinary differential equations, and some numerical results are given. Quasilinearization is then used to solve the inverse problem numerically. The results of some computational experiments are given which indicate the sensitivity of the estimates of the source distribution to the observational errors in the emergent radiation measurements. The methods can be generalized to the cases of anisotropic scattering and shell geometry. (Author)

**AD-628 771 Fld. 20/14, 9/5**
**CFSTI Prices: HC $1.60 MF $0.50**
*INNSBRUCK UNIV (AUSTRIA)*
**BEARING TECHNIQUE IN THE NEAR FIELD OF A MAGNETIC TRANSMITTING DIPOLE IN THE VLF REGION.**
Interim scientific rept. no. 16,
by N. Nessler, and G. Tinhofer. 15 Aug 65, 17p.
Contract AF 61 (052)-490,
AFCRL 66-36

Unclassified report

See also AD-622 072.

Descriptors: (*Electromagnetic waves, Very low frequency), (*Antenna radiation patterns, Rock (Geology)), Magnetic fields, Dipole antennas, Propagation, Measurement, Theory, Austria, Graphics, Wave transmission

From the theory of the radiating magnetic dipole two methods are being derived which permit the location of such a dipole in a dissipative medium (rock). One method is based on the trend of field lines, using the angular adjustment of a range-finder antenna for the accurate location even over large distances, the measurement being made by means of earphones. The second measurement uses the intensity distribution of the magnetic field strength yielding in some cases a very simple possibility of evaluation by means of diagrams. The measuring devices and the technique of measurement are explained in detail. A location actually made in a mine is also described in detail, serving as an example of the numerous possibilities of application. (Author)



211-792 O-66-8

**AD-628 772 Fld. 20/14, 4/1**
**CFSTI Prices: HC $6.00 MF $1.50**
*MITRE CORP BEDFORD MASS*
**PROCEEDINGS OF THE TROPOSPHERIC REFRACTION EFFECTS MEETING (3RD). VOLUME II. ANALYTICAL AND EXPERIMENTAL REFRACTION RESEARCH RESULTS.**
Jan 66, 270p. Contract AF 19 (628)-2390, Proj. 705.1,
ESD TDR-64-148-Vol-2

Unclassified report

See also AD-609 731.

Descriptors: (*Electromagnetic waves, Atmospheric refraction), (*Troposphere, Refractive index), (*Ionosphere, Refractive index), (*Atmospheric refraction, Refractive index), Multipath transmission, Angle of arrival, Phase measurement, Interferometers, Polariscopes, Refractometers, Tracking telescopes

Vol. II contains papers on certain refraction activities at the Eastern Test Range, the Electronic Systems Division, the Pacific Missile Range, the National Bureau of Standards, Ft. Huachuca, the Ballistic Research Laboratory, MIT Round Hill, Cold Lake, Canada, covering new measurement techniques, and discussing tropospheric and ionospheric effects on interferometer systems.

**AD-628 773 Fld. 20/14, 9/1**
**CFSTI Prices: HC $2.00 MF $0.50**
*MITRE CORP BEDFORD MASS*
**WAVEGUIDE TRANSMISSION CAVITY WITH LOSSES,**
by Jerome L. Altman. Feb 66, 27p. Rept. no. TM-04153,
Contract AF 19 (628)-5165, Proj. 750,
ESD TR-65-148

Unclassified report

Descriptors: (*Waveguides, Transmission lines), (*Transmission lines, Waveguides), Microwave networks, Cavity resonators

The symmetrical-but lossy-waveguide transmission cavity is analyzed with respect to resonant length, minimum and maximum insertion losses, and 3-db frequencies (loaded Q-factor). Losses are considered to originate both in the cavity proper and in the input and output discontinuities. A preferred representation of those discontinuities makes it possible effectively to lump all the various losses together. All the quantities of interest (resonant length, insertion losses and Q sub L-factor) are expressed in terms of the input and output discontinuity equivalent circuit. The results are quite general, but they will be of particular interest in the case of a transmission filter whose input and output are voltagecontrolled varactors. Normalized plots of resonant lengths, insertion loss at resonance, and Q sub L-factors conclude the study. The reactive component of the inputoutput equivalent circuit is the independent variable. The resistive component is the parameter. Loci of constant insertion losses, plotted on the Q sub L graphs, makes it possible to determine the maximum achievable Q sub L for a given insertion loss and resistive component; or the maximum resistive component for a given Q sub L and a prescribed insertion loss; or the minimum insertion loss for given Q sub L and resistive component. (Author)

**AD-628 778 Fld. 20/14, 9/5**
**CFSTI Prices: HC $3.60 MF $0.50**
*MITRE CORP BEDFORD MASS*
**MODE THEORY APPROACH TO ARRAYS,**
by R. H. T. Bates. Feb 66, 31p. Rept. no. TM-04110,
Contract AF 19 (628)-2390, Proj. 615.1,
ESD TR-65-147

Unclassified report

Descriptors: (*Electromagnetic waves, Propagation), (*Phased arrays, Waveguides), Antenna radiation patterns, Transmission lines

Attention is concentrated on the radiating and evanescent modes which must appear, both in free space and in the receiving transmission lines, when an infinite array of radiators is illuminated by a plane wave. If the radiators have a tendency to form a slow-wave structure (as all radiators must, even if to only a very slight degree), then for angles of incidence greater than a certain amount there can be propagating modes (surface waves capable of carrying power) supported by the radiators. These propagating modes are dubbed 'internal grating lobes' because they can appear even if the spacing of the radiators is close enough to prohibit the possibility of grating lobes in free space. The main effect of the internal grating lobes is to cause mismatching of the array, thereby deteriorating its scanning performance. It was found possible to demonstrate the existence of internal grating lobes experimentally. The main conclusion is that the simplest types of radiators (slots in a flat sheet or dipoles above a ground plane) are probably best for phased arrays because, of all types considered both practical and imaginable, they have the least slow-wave character. (Author)

**AD-628 809 Fld. 20/14, 4/1**
**CFSTI Prices: HC $1.10 MF $0.50**
*GENOA UNIV (ITALY) ISTITUTO GEOFISICO E GEODETICO*
**UPPER ATMOSPHERE VLF SOURCE (ON WHISTLERS AND VLF EMISSIONS RECORDED AT ROBURENT, NORTH ITALY).**
Final rept.,
by M. Bossolasco, A. Caneva, G. Cicconi, I. Dagnino, and A. Elena. Oct 65, 4p. Contract AF 61 (052)-591,
AFCRL 66-39

Unclassified report

Descriptors: (*Whistlers, Upper atmosphere), (*Very low frequency, Atmospherics), Diurnal variation, Ionosphere propagation, Terrestrial magnetism, Italy, Sources

For several months Whistlers and VLF emissions are recorded at Roburent (North Italy) with an appropriated instrumentation. The preliminary results thereby obtained are presented and discussed. For some characteristics of the whistling atmospherics there is a good agreement with the results found at Durban, South Africa (not to far from the conjugate point of Roburent). (Author)

**AD-628 816 Fld. 20/14, 4/2**
**CFSTI Prices: HC $1.10 MF $0.50**
*CENTRE NATIONAL D'ETUDES DES TELECOMMUNICATIONS ISSY-LES-MOULINEAUX (FRANCE)*
**ATLANTIC, DUCT PROJECT.**
Final scientific rept.,
by P. Misme. 1 Oct 65, 8p. Contract AF 61 (052)-631,
AFCRL 66-40

Unclassified report

Descriptors: (*Radio waves, Propagation), Atlantic Ocean, Marine meteorology, Wave transmission, Attenuation

For decimetric waves transmission losses on a transhorizon link are such that present techniques do not permit transmitters and receivers to be more than a few hundred kilometers apart. However, in some special cases, due to the structure of the atmosphere, one may anticipate for definite areas of the world, a possibility of transmitting over much greater distances than currently admitted. The study of the trade winds reversal areas within the northern part of the equatorial Atlantic, may lead one to assume the existence of a duct expanding over several thousand kilometers between the Caribbean Sea and West Africa. The subject of this study is to check this possibility and contingently to infer there from some characteristics of the atmosphere. (Author)

**AD-628 871 Fld. 20/14, 17/2.1**
**CFSTI Prices: HC $2.60 MF $0.50**
*NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AERO-ELECTRONIC TECHNOLOGY DEPT*
**MULTIPATH ENVIRONMENT SIMULATOR.**
Phase rept.,
by F. P. Darreff. 26 Jan 66, 29p. Rept. no. NADC-AE-6525,
Task RMWC42070/2021/S061-00-00,

Unclassified report

Descriptors: (*Multipath transmission, Simulators), (*Radio waves, Propagation), Air-to-air, Television communication systems, Video signals, Ionospheric propagation

The operation of a laboratory simulator which duplicates a one way propagation path between two airborne systems is described. An arbitrary input signal is modified to simulate a signal received in flight. The modified signal corresponds to a signal containing energy from a direct and a reflected path. (Author)

**AD-628 084 See Fld. 4/1**

**AD-628 217 See Fld. 9/5**

**AD-628 227 See Fld. 17/2**

**AD-628 272 See Fld. 4/1**

**AD-628 273 See Fld. 20/9**

**AD-628 281 See Fld. 4/1**

**AD-628 635 See Fld. 9/1**

**AD-628 682 See Fld. 9/1**

**AD-628 802 See Fld. 22/2**

**AD-628 859 See Fld. 9/5**

# Field 21-PROPULSION AND FUELS

## 21/2. COMBUSTION AND IGNITION

**AD-628 144 Fld. 21/2, 7/4**
**CFSTI Prices: HC $1.60 MF $0.50**
*LOUVAIN UNIV (BELGIUM) LAB OF INORGANIC CHEMISTRY*
**THEORETICAL AND EXPERIMENTAL STUDY OF REACTION KINETICS IN FLAMES.**
Final technical rept.,
by A. Van Tiggelen. Oct 65, 16p. Contract AF-EOAR-42-63,
AFOSR 65-2240

Unclassified report

Descriptors: (*Flames, Reaction kinetics), (*Reaction kinetics, Flames), Combustion, Flammability, Turbulence, Burning rate, Temperature, Methane, Oxygen compounds

The existence of fundamental flammability limits is discussed. In case of a chain reaction mechanism the latter are predicted theoretically but the experimental are probably different from the theoretical limits. Other considerations are related to the a priori evaluation of dissociation energies. A formula is proposed which is based on two empirical parameters which characterize any kind of radical. An experimental study of lifted turbulent flames is reported; it links the stability of such flames with the characteristic turbulence parameters: intensity and scale. The location of the anchoring place of the flame corresponds to the locus where a stoichiometric composition is attained. Burning velocities, flame temperatures and flame thickness have been measured for methane-oxygen flames, extending from very rich to very poor mixtures at different degrees of dilution with nitrogen. The kinetical parameters which can be derived from these data strongly suggest the following branching reaction: H + O2 yields OH + O. (Author)

AD-628 306 Fld. 21/2, 7/4
CFSTI Prices: HC $1.60 MF $0.50
*FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO*
**FLAME PROPAGATION UNDER CONDITIONS OF AN IGNITION PENINSULA OF HYDROGEN-OXYGEN MIXTURES,**
by V. Ya. Basevich, and S. M. Kogarko. 21 Oct 65, 19p. Rept. no. ftd-TT-65-919, TT 66-60580
Unclassified report

Unedited rough draft trans. of Kinetika i Kataliz (USSR) v6 n1 p23-30 1965.

Descriptors: (*Flame propagation, Reaction kinetics), (*Hydrogen, Flame propagation), (*Oxygen, Flame propagation), (*Autoignition, Flame propagation), Combustion, Catalysis, Numerical analysis, Temperature, Pressure, Thermodynamics, USSR

Hydrogen-oxygen flames were investigated under conditions, when in the combustion zone temperatures and pressures are realized, corresponding to an ignition peninsula. It appears possible to use the well-known mechanism of chemical reactions and velocity constants for kinetic calculation of flame propagation. Calculations were carried out on an electronic computer and showed, that at proper selection reaction rate constants, the experiment can be described with great accuracy. Selection of values of process rate constants H + O2 + M6 (yields) HO1 + M very strongly affects the calculation results, so that from comparing the results of calculations and experiment its value can be derived. (Author)

AD-628 228 See Fld. 7/4

## 21/3. ELECTRIC PROPULSION

AD-628 516 See Fld. 20/9

## 21/4. FUELS

AD-628 673 Fld. 21/4, 11/8
CFSTI Prices: HC $5.00 MF $1.00
*MONSANTO RESEARCH CORP EVERETT MASS BOSTON LAB*
**EFFECTS OF SELECTED STRAINS OF MICROORGANISMS ON THE COMPOSITION OF FUELS AND LUBRICANTS.**
Final rept., 1 Sep 62-27 Nov 64,
by Glenn R. Wilson, John O. Smith, H. F. Martin, Dolph Klein, and E. C. Harrington. Jan 66, 154p. Rept. no. MRB-2023F,
Contract AF 33 (657)-9814, Proj. AF-3048, Task 304801,
RTD TDR-63-4117-Pt-2
Unclassified report

See also AD-433 250.

Descriptors: (*Jet engine fuels, Microorganisms), (*Lubricants, Microorganisms), (*Liquid rocket propellants, Microorganisms), (*Hydrocarbons, Microorganisms), (*Microorganisms, Contamination), Bacteria, Fungi, Growth, Alkanes, Cycloalkanes, Fuels

A select number of aerobic bacterial and fungal cultures (isolates from contaminated fuel tank bottoms) were screened against a variety of jet fuels (JP-4 and JP-6), a lubricant, a liquid rocket propellant, and a spectrum of pure hydrocarbons (naphthenes and normal and branched alkanes) for growth-supporting properties. Variable growth support on all jet fuel samples was noted with the exception of one which was found to contain no detectable normal alkanes. Removal of normal alkanes from the other jet fuel samples significantly reduced their growth-supporting properties. The normal alkanes supported the most growth, the 2-methyl and 2,2-dimethyl alkanes lesser growth, and the naphthenes no growth support. After the prolonged incubation of several of the bacterial cultures on the initially resistant jet fuel sample, several cultures adapted to it. A variety of jet fuel additives were also screened against bacterial cultures and certain types were found to inhibit growth. (Author)

## 21/5. JET AND GAS TURBINE ENGINES

AD-628 775 Fld. 21/5
CFSTI Prices: HC $9.60 MF $0.75
*ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN*
**PARTIAL ALTITUDE MILITARY QUALIFICATION TEST OF THE TF37-GE-1 TURBOFAN ENGINE,**
by J. R. Evans, and C. E. Chamblee. Feb 66, 98p. Rept. no. AEDC-TR-66-15,
Contract AF 40 (600)-1200, Proj. AF-3066,
Unclassified report

Prepared in cooperation with ARO, Inc., Tullahoma, Tenn.

Descriptors: (*Turbofan engines, Captive tests), Performance (Engineering), Test methods, Experimental data, Altitude, Tests, Military requirements, Specifications

A partial altitude military qualification test of the TF37-GE-1 turbofan engine was conducted in accordance with the procedures outlined in MIL-E-5009B dated January 1958. Steady-state and/or transient data were obtained at flight conditions in the altitude range from sea level to 36,000 ft and in the Mach number range from 0 to 1.0 with standard, hot, and cold atmospheres. The steady-state engine performance in terms of net thrust and specific fuel consumption was equal to or better than the rated performance. Windmill starts and simulated flameouts and relights at altitudes up to 26,000 ft were successfully accomplished. The qualification test was terminated prior to completion because of compressor damage caused by foreign object ingestion. (Author)

AD-628 057 See Fld. 15/5

AD-628 235 See Fld. 13/11

## 21/9. ROCKET PROPELLANTS

AD-628 166 Fld. 21/9
CFSTI Prices: HC $4.00 MF $1.00
*AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C*
**LIQUID AND SOLID PROPELLANTS TECHNOLOGY: COMPILATION OF ABSTRACTS.**
Rept. no. 2 on ATD work assignment no. 77,
by Edward Wolski. 7 Jan 66, 143p. Rept. no. ATD-66-2,
TT 66-60553
Unclassified report

Based on Soviet-bloc open literature and covers the period Jul-Dec 64. Rept. on Surveys of Communist World Scientific and Technical Literature.

Descriptors: (*Bibliographies, Rocket propellants), (*Rocket propellants, Bibliographies), Liquid rocket propellants, Solid rocket propellants, Abstracts, USSR

This compilation of abstracts is based on Soviet-Satellite open sources published in 1964. It is the second in a series dealing with Soviet-bloc developments in rocketpropellant technology and consists of abstracts, summaries, reviews, and current data from the ATD Press and SCAN, supplemented by the compiler's annotations of pertinent entries not covered by the foremention ATD publications. The systematic arrangement of all available materials gives the reader the potential advantage of trend determination. The general subject of liquid and solid propellants includes the chemistry and technology of manufacturing, physical and chemical properties, use, combustion behavior, corrosiveness, stability, toxicity, storage, and safety of propellants and their components. Of 212 entries, 15 were based on books and appear as Chapter I together with an Author Index. Chapter II contains 55 abstracts on liquid propellants. In Chapter III 38 entries concern solid propellants. Chapter IV has 16 entries on high energy fuels and propellants while Chapter V contains 7 entries on advanced energy sources. Chapter VI with 81 entries covers combustion problems in general including air-breathing systems. Chapters II-VI each include an Author Index and an Index of Associations. (Author)

## 21/9.2 SOLID ROCKET PROPELLANTS

AD-628 716 See Fld. 20/11

# Field 22-SPACE TECHNOLOGY

## 22/1. ASTRONAUTICS

AD-628 062 Fld. 22/1, 22/3
CFSTI Prices: HC $7.00 MF $1.50
*TRW SPACE TECHNOLOGY LABS REDONDO BEACH CALIF*
**INVESTIGATION OF THE ACQUISITION PROBLEM IN SATELLITE ATTITUDE CONTROL.**
Final rept., 1 Apr 64-31 Mar 65,
by A. E. Sabroff, R. L. Farrenkopf, A. M. Frewand, and M. H. Gran. Dec 65, 319p. Rept. no. 4154-6008-RU001,
Contract AF 33 (615)-1535, Proj. AF-8219, Task 821904,
AFFDL TR-65-115
Unclassified report

Descriptors: (*Satellite attitude, Attitude control systems), (*Attitude control systems, Automatic), Stability, Nonlinear systems, Equations of motion, Euler's angles, Optimization, Control

The acquisition function of a spacecraft attitude control system consists of properly orienting the vehicle with respect to specified reference directions starting from large initial attitude and rate errors. The resulting control system design problem was examined by establishing suitable mathematical representations, comparing competing control concepts, developing a practical optimization approach, and evaluating a new technique for applying Lyapunov stability theory to the acquisition problem. (Author)

AD-628 596 Fld. 22/1
CFSTI Prices: HC $1.60 MF $0.50
*AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO*
**FEASIBILITY OF USING HANDRAILS TO MOVE ALONG A SURFACE WHILE WEIGHTLESS.**
Final rept., Jun-Oct 64,
by Edwin H. Sasaki. Aug 65, 12p. Rept. no. AMRL-TR-65-152,
Proj. AF-7184, Task 718405,
Unclassified report

Descriptors: (*Weightlessness, Safety devices), (*Safety devices, Weightlessness), Astronauts, Feasibility studies, Maneuverability, Stability, Pressure suits, Aircraft, Surfaces, Human engineering

A preliminary investigation into the feasibility of using handrails as an aid to the astronaut in moving from one location to another within or outside a

space vehicle was undertaken in a JC-131B zero-G airplane. Eight subjects wearing flying coveralls (one of whom also performed the tests wearing an inflated full-pressure suit) moved from one point to another aided by a single handrail or two parallel handrails. Eight conditions were investigated with the parallel handrails spaced from 6 to 36 inches apart and one with the single handrail. All subjects were successful in moving across the surface and turning around using both the single and parallel handrails. Motion picture films were taken to evaluate the body positions and ease of movement. The most common position appeared to be one in which the elbows and knees were slightly bent and the torso was nearly parallel to the surface. The parallel handrails spaced from 16 to 24 inches apart appeared to provide the greatest body stability. (Author)

**AD-628 053** See Fld. 22/2

**AD-628 136** See Fld. 22/3

**AD-628 222** See Fld. 20/14

**AD-628 247** See Fld. 22/2

## 22/2. SPACECRAFT

**AD-628 053 Fld. 22/2, 22/4, 22/1**
**CFSTI Prices: HC $4.00 MF $0.75**
*ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN*
**DEVELOPMENT TESTING OF SPACE VEHICLES,**
by Donald D. Carlson, and George MacFarlane.
Feb 66, 112p. Rept. no. AEDC-TR-65-199,
Unclassified report

Descriptors: (*Spacecraft, Experimental design), (*Astronautics, State-of-the-art reviews), Aerospace craft, Ground support equipment, Captive tests, Flight testing, Test facilities, Test methods

This report reviews the salient characteristics of various classes of spacecraft, unmanned and manned, present and future. The test objectives and testing techniques used for development of aerospace vehicles are discussed. This portion includes the range of required ground test facilities and the role that flight test programs play. The report also discusses the hypothetical ground test facilities that will be needed to test adequately the conceptual systems of the future, and concludes with the role of earth-orbiting research laboratories in the overall spectrum of flight testing. (Author)

**AD-628 078 Fld. 22/2, 16/4**
**CFSTI Prices: HC $2.00 MF $0.50**
*ATLANTIC RESEARCH CORP DUARTE CALIF MISSILE SYSTEMS DIV*
**CONTRACTOR DATA REQUIREMENTS LIST. SEQUENCE NUMBER 71.**
Semi-annual progress rept. 2 Aug-31 Dec 65.
31 Jan 66, 47p. Rept. no. 220-ST-141,
Contract AF 04 (694)-220,
Unclassified report

Descriptors: (*Reentry vehicles, Specifications), (*Launch vehicles (Aerospace), Specifications), Systems engineering, Guided missiles, Payload, Production control, Quality control

The overall performance of the Athena vehicle systems capability is presented.

**AD-628 247 Fld. 22/2, 22/1**
**CFSTI Prices: HC $3.60 MF $0.50**
*LOUVAIN UNIV (BELGIUM)*
**ON THE INFLUENCE OF THE ELASTICITY OF COMPONENTS IN A SPINNING SATELLITE ON THE STABILITY OF ITS MOTION,**
by F. Buckens. 1966, 35p. Contract AF-EOAR-65-66,
FOSR 65-2740
Unclassified report

Descriptors: (*Satellites (Artificial), Spin stabilization), (*Spin stabilization, Satellite attiude), (*Spacecraft components, Elasticity), Equations of motion, Gravity, Terrestrial magnetism, Damping

When a rigid body in free space is spinning around one of its principal axes, besides the three translational modes with zero frequency and one rotational mode of zero frequency around the spin axis, one may consider two rotational modes of small amplitudes of oscillations around the two remaining axes, which will be called nutational modes. Their frequencies do not vanish and are only real f the spinning motion is stable.. If now the body is allowed to be slightly elastic, the frequencies of the nutational modes will be altered, but at the same time there will appear new frequencies corresponding to the so-called elastic modes. Natural stability of such systems and stability of spinning motion in magnetic and gravitational fields are important questions and must be considered when designing spin stabilized satellites. This investigation is conceived on a general basis and brings up only the broad features of a rather complex problem.

**AD-628 615 Fld. 22/2, 11/3**
*LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF*
**EFFECTS OF ELECTRON BOMBARDMENT ON THE OPTICAL PROPERTIES OF SPACECRAFT TEMPERATURE CONTROL COATINGS.**
Revised ed.,
by R. A. Breuch, N. J. Douglas, and D. Vance.
24 Jun 65, 10p.
Unclassified report

*Availability: Published in AIAA Journal, v3 n12 p2318-27 Dec 1965. Copies to DDC users only.*

Descriptors: (*Spacecraft, Coatings), (*Coatings, Electron bombardment), Optical properties, Degradation, Space environmental conditions, Simulation, Temperature control, Performance (Engineering), Ultraviolet radiation, Test methods, Data

Ten thermal control materials were exposed in vacuum, at controlled temperatures, to a simulated geomagnetically trapped high-energy electron environment. The test parameters included a calculated mean electron energy of 0.80 Mev and total integrated fluxes of 10 to the 14th, 15th, and 16th power electrons/sq cm. Sample temperatures were -180, +60, and +300F. Optical damage spectra for the materials tested are reported, and mechanical damage is discussed. The behavior of optical properties after 485 sunhours of near-ultraviolet energy is presented for purposes of comparison. The extent of optical damage from electron bombardment ranges from an undetectable level to an increase in solar absorptance of more than 100% for the material systems tested. Selected materials exposed to electron fluxes and then subsequently exposed to an ultraviolet environment were damaged to more than an algebraic addition of the degrading effects of the two separate environments would predict. (Author)

**AD-628 802 Fld. 22/2, 4/1, 20/14**
**CFSTI Prices: HC $1.10 MF $0.50**
*DANISH METEOROLOGICAL INST COPENHAGEN GEOPHYSICAL SECTION*
**IONOSPHERIC RESEARCH USING SATELLITES.**
Annual summary rept. no. 1, 1 Sep 64-31 Aug 65,
by Asger Lundbak. 30 Sep 65, 6p. Contract AF 61 (052)-828,
AFCRL 66-77
Unclassified report

Descriptors: (*Ionosphere, Radio signals), (*Meteorological satellites, Signals), Magneto-optic effect, Scintillation, Recording systems, Ionosphere, Atmospheric sounding

The report is of administrative character. It deals with receipt of unmodulated satellite signals, the purpose being to record Faraday rotation and scintillation on 20 and 40 Mc/s. The signals are recorded both in Greenland and Denmark, and the satellites in question are Explorer 22 and Explorer 27. (Author)

**AD-628 080** See Fld. 8/7

**AD-628 599** See Fld. 20/11

## 22/3. SPACECRAFT TRAJECTORIES AND REENTRY

**AD-628 111 Fld. 22/3, 20/4**
**CFSTI Prices: HC $1.60 MF $0.50**
*ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB*
**AERODYNAMIC TORQUE ON A SPINNING SPHERICAL SATELLITE,**
by Gerald R. Karr. Jan 66, 20p. Rept. no. R-275,
Contract DA-28-043-AMC-00073 (E) ,NSG-443
Unclassified report

Descriptors: (*Aerodynamics, Satellites (Artificial)), (*Satellites (Artificial), Torque), Spin, Superaerodynamics, Center of mass, Gyroscopes

Calculations have revealed that a spinning spherical satellite moving through a rarefield atmosphere experiences precessional torque as well as the expected 'slow down torque.' The objective of this investigation is to determine the angular displacement of a gyroscopic satellite due to aerodynamics for comparison with the small angular displacement due to a general relativity effect described by Schiff. The analysis has shown that the directional movement of the spin axis due to aerodynamic effect is of such magnitude as to dictate the altitude at which the relativity experiment must be orbited in order to reduce the angular displacement in comparison with the 5 to 7 sec of arc per year expected from the Schiff effect. Also of great importance is the finding that measurements of the satellite spin axis movement due to aerodynamics could be used for accurate determination of the molecular accommodation coefficient in the orbital environment. Studies are being made to determine the best way to utilize this new method to measure the accommodation coefficient under actual orbital conditions. Through the use of various material surfaces, surface temperature, and surface roughness, a series of experiments to study gas-surface interactions could be designed. (Author)

**AD-628 136 Fld. 22/3, 22/1**
**CFSTI Prices: HC $5.00 MF $1.00**
*HONEYWELL INC MINNEAPOLIS MINN MILITARY PRODUCTS GROUP*
**FEASIBILITY STUDY OF NEW TECHNIQUES FOR CONTROL OF RE-ENTRY VEHICLES. VOL. I. CALCULATION OF OPTIMAL TRAJECTORIES AND SYNTHESIS OF CONTROL FUNCTIONS,**
by D. K. Scharmack, G. D. Swanlund, M. D. Ward, R. G. Johnson, and E. R. Rang. Mar 64. 187p. Contract AF33 (657)-7383, Proj. AF-8225, Task 82181,
FDL TDR-64-13-vol-1
Unclassified report

Descriptors: (*Reentry vehicles, Control systems), (*Atmosphere entry, Trajectories), (*Astronautics, Atmosphere entry), Spacecraft, Descent trajectories, Optimization, Simulation, Computers, Calculus of variations

Optimization techniques are used to synthesize the control programs and compute the correspond-

ing flight paths for controllable re-entry vehicles. Linear perturbation control about these reference trajectories is investigated. A large portion of the theory of the calculus of variations is modified and extended to apply to this problem. Many details of computational techniques, necessary in the adaptation of the theory to large scale digital calculation, are reported. The optimization method which evolves is a modification of a Newton -Raphson iteration, although gradient procedures are also studied. The criteria for re-entry trajectories are functionals of the motion related to the heating of the vehicle. It is found that these criteria are relatively insensitive to the flight path, and this fact leads to computational problems which must be handled carefully. The paths and control authority are constrained by reasonable physical requirements. The linear perturbational control is found by requiring the integral of the square of the control deviation to be minimum. The vehicle position is the object of control in the cases studied. It is found that this form of control can be used throughout the entire re-entry corridor. Various modifications of the control gain program at the end of the trajectory are considered. (Author)

**AD-628 208 Fld. 22/3, 3/3**
**CFSTI Prices: HC $1.60 MF $0.50**
*ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB*

**EFFECTS OF MICROMETEOROID CRATERING ON THE DIRECTION OF THE AXIS OF MAXIMUM MOMENT OF INERTIA,**
by Harold O. Barthel. Feb 66, 13p. Rept. no. R-274,
Contract DA-28-043-AMC-00073 (E) ,NSG-443

Unclassified report

Descriptors: (*Satellites (Artificial), Celestial mechanics), (*Celestial mechanics, Satellites (Artificial)), Meteors, Moment of inertia, Momentum, Damping, Relativity theory

The use of an artificial earth satellite as a gyroscope for measurement of a possible effect of general relativity, described by Schiff, is being studied. Mirrors on the surface of a fully passive spinning satellite will be used to reflect solar light for measuring a predicted change of six seconds of arc in the spin axis direction during a one year experiment. Although long term changes in the angle between the mirrors and the satellite spin axis can be corrected for, short term changes during the course of a measurement (several weeks) can cause significant errors in the data. Because of the high degree of inertial symmetry necessary for reduction of gravitygradient torque, meteoroids which do not significantly disturb the direction of angular momentum have a significant effect, after damping, on the direction of the body axis and mirrors relative to the spin axis. The effect of meteoroids on the principal axes of inertia, which ultimately control the body axis, is discussed herein. (Author)

**AD-628 062 See Fld. 22/1**

**AD-628 143 See Fld. 20/9**

**AD-628 184 See Fld. 8/5**

**AD-628 466 See Fld. 17/8**

**AD-628 547 See Fld. 20/13**

## 22/4. SPACECRAFT LAUNCH VEHICLES AND GROUND SUPPORT

**AD-628 053 See Fld. 22/2**

How To Use Indexes To TAB Portion Of

U. S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS

## SUBJECT INDEX

The Subject Index is arranged alphabetically by asterisked descriptors from the document announcements in the TAB. Each announcement contains one or more asterisked descriptors which identify the main subjects of the report. The asterisked descriptor may or may not have a modifying descriptor appearing directly below the asterisked descriptor. Under each descriptor entry in the Subject Index appear the following items of information: annotation, AD number, and field/group. A typical subject index entry is shown below.

*ALUMINUM
GLASS TEXTILES
INVESTIGATION OF GLASS-
METAL COMPOSITE MATERIALS
AD-619 773 FLD. 11/7

## PERSONAL AUTHOR INDEX

The Personal Author Index is arranged alphabetically by the last names of the authors of reports. When several report entries are given for one author, the entries are arranged numerically by AD number. Field/group and titles are also listed. Three asterisks serve as a separator between entries for reports under the same author. A typical personal author entry is shown below.

*CHASE, JOHN W.
* * *
THE LANTHANUM, EUROPIUM,
AND DYSPROSIUM CONTENTS OF
TWO TEKTITES
AD-619 828 FLD. 8/7
* * *
A PROCEDURE FOR GEOCHEMICAL
INTERPRETATION OF TERRESTRIAL
RARE-EARTH ABUNDANCE PATTERNS
AD-619 834 FLD. 8/7

## CORPORATE AUTHOR-MONITORING AGENCY INDEX

The Corporate Author-Monitoring Agency Index is arranged alphabetically by corporate authors and monitoring agencies.

In the corporate author entry for each document are listed the originator of the report, the originator's report number, the title, AD number, and field/group. If the source has listed a monitoring agency in the report, the monitor acronym and monitor series number are given in parenthesis directly under the title. An IDEP (Interservice Data Exchange Program) report number is presented in the same way. A typical corporate author entry is shown on the next page.

211-291 O - 66 - 9

*AEROJET- GENERAL CORP AZUSA
CALIF

* * *

TR3015
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
(AFOSR 65-1058)
AD-619 513 FLD. 7/4

The three asterisks serve as a separator between entries for reports under the same corporate author.

When a report lists a monitoring agency, a corresponding entry is provided under the name of the monitoring agency, which appears in alphabetical order among the corporate author entries. In a monitoring agency entry, the report number is given above the title in place of the originator's report number. A typical monitoring agency entry is shown below.

*AIR FORCE OFFICE OF SCIENTIFIC
RESEARCH WASHINGTON D C

* * *

65-1058
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
AD-619 513 FLD. 7/4

## CONTRACT INDEX

The Contract index is arranged alphanumerically by contract number. Within a contract grouping, each entry contains corporate author, series number (if any), monitor number (if any), AD number, and field/group.

When there are multiple document entries under one contract number, entries are arranged by AD number under each corporate author represented.

A contract entry may also contain a letter F, A, or S on the left-hand margin, indicating that the document is a Final, Annual, or Summary report. A typical contract entry is shown below.

*AF19 628 5167
LINCOLN LAB MASS INST OF TECH
LEXINGTON
(ESD TDR-65-315)
AD-619 580 FLD. 9/5
(ESD TDR-65-309)
AD-619 708 FLD. 3/1

## REPORT NUMBER INDEX

The Report Number Index lists identifying numbers assigned either by the document originators or by the sponsors of the work described in the documents. The AD number and field/group location in TAB are given for each report number. If both the originator and the sponsor of a document have assigned identifying numbers, listings for both will appear in the respective alphanumeric positions.

In certain cases accession numbers are also given with the corresponding AD numbers and TAB locations; for instance, the IDEP (Interservice Data Exchange Program) reports and the CFSTI-TT reports (Technical Translations from the Clearinghouse for Federal Scientific and Technical Information).

| | |
|---|---|
| CCL-183 | |
| AD-620 154 | FLD. 11/9 |
| CRSR-203 | |
| AD-620 250 | FLD. 3/1 |
| DPS-1677 | |
| AD-469 558 | FLD. 19/1A |

## AD-FIELD INDEX

The AD-Field Index is arranged numerically by AD number and lists the field/group where the full entry can be located in TAB.

# SUBJECT INDEX

The fields/groups indicated here apply only to the Technical Abstract Bulletin Section (on white paper).


•ABLATION
GRAPHITE
REPRINT: HIGH-TEMPERATURE KINETICS OF GRAPHITE OXIDATION BY DISSOCIATED OXYGEN.
AD-628 282 FLD. 11/2

•ABRASIVES
PARTICLE SIZE
REPRINT: EFFECT OF ABRASIVE PARTICLE SIZE ON WEAR.
AD-628 718 FLD. 11/11

•ABSORPTION SPECTRUM
ANALYSIS
ANALYSIS OF THE SPECTRUM OF THE NITRIC OXIDE MOLECULE.
AD-628 818 FLD. 7/4

•ABSORPTION(PHYSICAL)
CEREALS
TRANSLATION OF RUSSIAN RESEARCH: CONCERNING SOME FEATURES OF WETTING AND DEHYDRATION OF GRAIN.
AD-628 430 FLD. 6/8

•ACETAL PLASTICS
CORROSION INHIBITION
TRANSLATION OF RUSSIAN RESEARCH: PROTECTION OF STEEL AND LIGHT ALLOYS WITH POLYVINYL BUTYRAL PHOSPHATIZING PRIMERS VL-023.
AD-628 185 FLD. 11/3

PREPARATION
TRANSLATION OF RUSSIAN RESEARCH: INVESTIGATION OF THE ROLE OF FREE RADICALS IN THE ACETALDEHYDE POLYMERIZATION PROCESS IN THE SOLID PHASE UNDER GAMMA-IRRADIATION.
AD-628 301 FLD. 7/5

•ACOUSTIC EQUIPMENT
SEMICONDUCTOR DEVICES
ACTIVE ACOUSTIC DEVICES.
AD-628 450 FLD. 9/1

•ACOUSTICS
PIPES
FINITE-AMPLITUDE TRAVELING WAVES WITH BOUNDARY DISSIPATION.
AD-628 671 FLD. 20/1

•ACRYLIC RESINS
COMPRESSIVE PROPERTIES
REPRINT: SHOCK WAVE COMPRESSION OF 'PLEXIGLAS' IN THE 2.5 TO 20 KILOBAR REGION.
AD-628 715 FLD. 20/11

•ADAPTIVE CONTROL SYSTEMS
FLIGHT CONTROL SYSTEMS
INVESTIGATION OF THE CONCEPT OF DIRECT FLIGHT CONTROL.
AD-628 087 FLD. 1/3

•ADAPTIVE SYSTEMS
CONTROL SYSTEMS
STOCHASTIC STABILITY AND THE DESIGN OF FEEDBACK CONTROLS.
AD-628 274 FLD. 12/1

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GEOMETRY AND PATTERNS OF LARGE APERTURE SEISMIC ARRAYS.
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TRANSLATION OF RUSSIAN RESEARCH: POLYESTER GLASS PLASTICS FOR SHIPBUILDING.
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VIBRATION
CALCULATED NATURAL FREQUENCIES AND NORMAL MODES OF THE GUIDED MISSILE CRUISER USS LONG BEACH (CG(N)-9).
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*PYLE-NATIONAL CO CHICAGO ILL
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MITRE CORP BEDFORD MASS
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(ESD-TR-65-125)
AD-628 629 FLD. 5/10
(ESD-TDR-64-148-VOL-2)
AD-628 772 FLD. 20/14
M-07459
(ESD-TR-65-402)
AD-628 777 FLD. 20/9
TM-04110
(ESD-TR-65-147)
AD-628 778 FLD. 20/14

•AF19(628)2395
MITHRAS INC CAMBRIDGE MASS
MC-62-99-R6
(AFCRL-66-16)
F AD-628 075 FLD. 20/3

•AF 19(628)-2438
MANLABS INC CAMBRIDGE MASS
(AFCRL-65-852)
AD-628 632 FLD. 20/12

•AF 19(628)-2758
RADIO CORP OF AMERICA MOORESTOWN N J MISSILE AND SURFACE RADAR DIV
(AFCRL-66-49)
F AD-628 900 FLD. 9/5
SCIENTIFIC-2
(AFCRL-66-98)
AD-628 902 FLD. 9/5

•AF 19(628)-3314
BLOCK ENGINEERING INC CAMBRIDGE MASS
(AFCRL-66-94)
F AD-628 784 FLD. 17/8

•AF 19(628)-3418
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
TM-930/009/00
AD-628 776 FLD. 9/2

•AF 19(628)-3828
EMMANUEL COLL BOSTON MASS•
(AFCRL-65-900)
AD-628 631 FLD. 4/1

•AF 19(628)-3900
ILLINOIS UNIV URBANA AERONOMY LAB
AERONOMY-8
(AFCRL-65-858)
AD-628 186 FLD. 20/9

•AF 19(628)-3990
BOSTON COLL CHESTNUT HILL MASS
SCIENTIFIC-1
(AFCRL-65-229)
AD-628 080 FLD. 8/7

•AF19(628)-4019
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
SCIENTIFIC-261
(AFCRL-66-19)
AD-628 084 FLD. 4/1

•AF 19(628)-4082
LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
SCIENTIFIC-5
(AFCRL-66-69)
AD-628 458 FLD. 8/11

•AF 19(628)-4157
BELL TELEPHONE LABS INC NEW YORK
SCIENTIFIC-1
(AFCRL-65-898)
AD-628 691 FLD. 9/1

•AF 19(628)-4351
LITTLE (ARTHUR D) INC CAMBRIDGE MASS
66498
(AFCRL-66-20)
F AD-628 793 FLD. 20/12

•AF 19(628)-4788
MICROWAVE LAB STANFORD UNIV CALIF
ML-1382
(AFCRL-65-920)
F AD-628 305 FLD. 20/1

•AF 19(628)-4976
GENERAL ELECTRIC CO SCHENECTADY N Y RESEARCH AND DEVELOPMENT CENTER
SCIENTIFIC-3
(AFCRL-65-896)
AD-628 770 FLD. 20/12

•AF 19(628)-5078
BROWN (D) ASSOCIATES INC EAU GALLIE FLA
DBA-321
(AFCRL-66-70)
F AD-628 184 FLD. 8/5

•AF 19(628)-5165
MITRE CORP BEDFORD MASS
TM-04153
(ESD-TR-65-148)
AD-628 773 FLD. 20/14

•AF 19(628)-5166
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF
SCIENTIFIC-1
(AFCRL-65-860)
AD-628 202 FLD. 5/7
SCIENTIFIC-2
(AFCRL-65-861)
AD-628 203 FLD. 9/2
SCIENTIFIC-3
(AFCRL-65-903)
AD-628 204 FLD. 9/2
TM-738/021/00
(AFCRL-65-918)
AD-628 205 FLD. 9/2
TM-2776
AD-628 206 FLD. 5/2

•AF 19(628)-5167
LINCOLN LAB MASS INST OF TECH LEXINGTON
TN-1965-69
(ESD-TDR-65-996)
AD-628 198 FLD. 8/11
REF 818-26
(ESD-TDR-65-998)
AD-628 200 FLD. 20/14
TN-1966-14
(ESD-TDR-66-32)
AD-628 493 FLD. 20/6
TN-1966-9
(ESD-TDR-66-19)
AD-628 494 FLD. 5/8
MS-1240
(ESD-TDR-65-991)
AD-628 558 FLD. 5/8
JA-2501
(ESD-TDR-66-25)
AD-628 559 FLD. 10/2
JA-2636
(ESD-TDR-65-983)
AD-628 560 FLD. 20/5
JA-2387A
(ESD-TDR-66-23)
AD-628 561 FLD. 5/10
JA-2499
(ESD-TDR-66-24)
AD-628 562 FLD. 5/10
JA-2689
(ESD-TDR-66-29)
AD-628 563 FLD. 20/6
JA-2599
(ESD-TDR-65-997)
AD-628 564 FLD. 5/8
JA-2627
(ESD-TDR-66-16)
AD-628 565 FLD. 5/2

•AF 29(601)-64-PO-10
BUREAU OF MINES DENVER COLO
(AFWL-TR-65-196)
AD-628 860 FLD. 8/7

•AF 29(601)-5376
FIELD EMISSION CORP MCMINNVILLE OREG
(AFWL-TR-65-1)
AD-628 506 FLD. 10/2

•AF 29(601)-6040
STANFORD RESEARCH INST MENLO PARK CALIF
(WL-TR-64-119)
F AD-628 796 FLD. 20/11

•AF 29(601)-6092
COLORADO SCHOOL OF MINES RESEARCH FOUNDATION INC GOLDEN
(AFWL-TR-65-121-VOL-1)
AD-628 865 FLD. 11/6

•AF 29(601)-6240
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
M-6069
(AFWL-TR-65-93)
AD-628 806 FLD. 13/13

•AF 29(601)-6408
SOUTHWEST RESEARCH INST SAN ANTONIO TEX
(AFWL-TR-65-71)
AD-628 069 FLD. 11/7

•AF 29(601)-6427

STANFORD RESEARCH INST MENLO PARK CALIF
(AFWL-TR-65-196)
F AD-628 803 FLD. 8/13

•AF 29(601)-6503
NORTRONICS NEWBURY PARK CALIF APPLIED RESEARCH DEPT
NARD-65-8-R
(AFWL-TR-65-165)
AD-628 863 FLD. 9/2

•AF 30(602)-2988
CENTRAL RADIO PROPAGATION LAB NATIONAL BUREAU OF STANDARDS BOULDER COLO
(NBS-TN-330)
AD-628 178 FLD. 20/14

•AF 30(602)-2980
POLYTECHNIC INST OF BROOKLYN FARMINGDALE N Y
(AFOSR-65-2951)
AD-628 729 FLD. 20/9

•AF 30(602)-3478
MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
(RADC-TR-65-390)
AD-628 450 FLD. 9/1

•AF 30(602)-3516
TRW SYSTEMS REDONDO BEACH CALIF
9253-6001-RU000
(RADC-TR-65-376)
F AD-628 135 FLD. 9/2

•AF 30(602)-3569
MICHIGAN UNIV ANN ARBOR ELECTRON PHYSICS LAB
(RADC-TR-65-280)
AD-628 732 FLD. 9/1

•AF 30(602)-3696
STROMBERG-CARLSON CORP SAN DIEGO CALIF
SC-9991012
(RADC-TR-65-451)
F AD-628 133 FLD. 20/6

•AF 30(602)-3731
TEXAS INSTRUMENTS INC DALLAS APPARATUS RESEARCH AND DEVELOPMENT LAB
U2-912008-2
(RADC-TR-65-465)
AD-628 046 FLD. 20/5

•AF 30(635)-11188
LENKURT ELECTRIC CO INC SAN CARLOS CALIF
(RADC-TDR-63-507-VOL-1)
AD-628 157 FLD. 9/5
(RADC-TDR-63-507-VOL-2)
AD-628 158 FLD. 9/5

•AF 33(615)-64-1005
NATIONAL BUREAU OF STANDARDS WASHINGTON D C
NBS TN-267
AD-628 586 FLD. 20/13

•AF 33(615)-1142
SENSORY SYSTEMS LAB TUCSON ARIZ
(AMRL-TR-65-172)
F AD-628 055 FLD. 17/1

•AF 33(615)-1185
ALLIS-CHALMERS MFG CO MILWAUKEE WIS SPACE AND DEFENSE SCIENCES DEPT
AD-628 129 FLD. 10/2

•AF 33(615)-1470
MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB
(ARL-65-242)
AD-628 570 FLD. 14/2

•AF 33(615)-1525
TRW SPACE TECHNOLOGY LABS REDONDO BEACH CALIF
9154-6008-RU001
(AFFDL-TR-65-115)
F AD-628 062 FLD. 22/1

•AF 33(615)-1544
FARR CYTOCHEMICAL LABS CAMDEN MAINE
(AMRL-TR-65-151)
F AD-628 045 FLD. 6/1

•AF 33(615)-1781
MINE LABS INC SAN FRANCISCO CALIF
(AMRL-TR-65-178)
F AD-628 593 FLD. 6/15

•AF 33(615)-1798
SYSTEMS RESEARCH LABS INC DAYTON OHIO
(ARL-65-246)
F AD-628 795 FLD. 20/9

•AF 33(615)-1889
SYSTEMS RESEARCH LABS INC DAYTON OHIO
(AMRL-TR-65-116-VOL-2)
F AD-628 693 FLD. 17/2

•AF 33(615)-2307
MICHIGAN UNIV ANN ARBOR COLL OF ENGINEERING
(ARL-65-234)
AD-628 543 FLD. 20/4

•AF 33(615)-2355
CBS LABS STAMFORD CONN
(AMRL-TR-65-175)
F AD-628 588 FLD. 17/8

•AF 33(615)-3202
RADIO CORP OF AMERICA SOMERVILLE N J ELECTRONIC COMPONENTS AND DEVICES
AD-628 712 FLD. 9/1

•AF 33(616)-8953
CINCINNATI UNIV OHIO DEPT OF AEROSPACE ENGINEERING
(ARL-65-245)
AD-628 549 FLD. 20/4
CINCINNATI UNIV OHIO HYPERSONIC AERODYNAMICS RESEARCH STAFF
(ARL-65-244)
AD-628 287 FLD. 20/4
(ARL-65-243)
AD-628 694 FLD. 20/4

•AF 33(657)-7311
WISCONSIN UNIV MADISON THEORETICAL CHEMISTRY INST
AD-628 480 FLD. 7/4

•AF 33(657)-7380
MINNESOTA UNIV MINNEAPOLIS HEAT TRANSFER LAB
(ARL-65-232)
AD-628 613 FLD. 20/9

•AF33(657)-7383
HONEYWELL INC MINNEAPOLIS MINN MILITARY PRODUCTS GROUP
(FDL-TDR-64-13-VOL-1)
AD-628 136 FLD. 22/3

•AF 33(657)-7940
ELECTRO-OPTICAL SYSTEMS INC PASADENA CALIF
(ARL-65-231)
F AD-628 268 FLD. 20/9

•AF 33(657)-8867
MICHIGAN UNIV ANN ARBOR COLL OF ENGINEERING
(ARL-65-234)
AD-628 543 FLD. 20/4

•AF 33(657)-8880
MICHIGAN UNIV ANN ARBOR COLL OF ENGINEERING
05096-1-F
F AD-628 333 FLD. 6/16

•AF 33(657)-9814
MONSANTO RESEARCH CORP EVERETT MASS BOSTON LAB
MRB-2023F
(RTD-TDR-63-4117-PT-2)
F AD-628 673 FLD. 21/4

•AF 33(657)-9914
CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF MECHANICAL ENGINEERING
(AFAPL-TR-64-133-PT-4)
F AD-628 617 FLD. 20/4
(AFAPL-TR-64-133-PT-5)
F AD-628 630 FLD. 20/4

•AF 33(657)-11347
THOMAS J WATSON RESEARCH CENTER YORKTOWN HEIGHTS N Y
(AMRL-TR-65-114)
F AD-628 684 FLD. 9/4

•AF 33(657)-11717
SYLVANIA ELECTRONIC SYSTEMS WALTHAM MASS APPLIED RESEARCH LAB
F-3052-2
(AMRL-TR-65-193)
F AD-628 873 FLD. 6/4

•AF 40(600)-1200
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN
AEDC-TR-66-15
AD-628 775 FLD. 21/5
ARO INC TULLAHOMA TENN
(AEDC-TR-65-262)
AD-628 091 FLD. 12/1
(AEDC-TR-65-123)
AD-628 380 FLD. 14/2
(AEDC-TR-66-10)
AD-628 628 FLD. 20/4

•AF 49(638)-313
INDIANA UNIV BLOOMINGTON DEPT OF CHEMISTRY
(AFOSR-65-2099)
AD-628 269 FLD. 7/4

•AF 49(638)-496
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MECHANICS
(AFOSR-66-0001)
AD-628 811 FLD. 20/4

•AF 49(638)-673
TRG INC MELVILLE N Y
(AFOSR-65-2969)
AD-628 253 FLD. 20/5

•AF 49(638)-783
OREGON STATE UNIV CORVALLIS DEPT OF CHEMISTRY
(AFOSR-65-2231)
F AD-628 060 FLD. 7/4

•AF 49(638)-798
CORNELL UNIV ITHACA N Y DEPT OF BIOCHEMISTRY
(AFOSR-65-2959)
AD-628 270 FLD. 6/1

•AF 49(638)-911
MICHIGAN UNIV ANN ARBOR INST OF SCIENCE AND TECHNOLOGY
(AFOSR-65-2910)
AD-628 275 FLD. 8/11

•AF 49(638)-1123
STANFORD UNIV CALIF DEPT OF MECHANICAL ENGINEERING
(AFOSR-66-0225)
AD-628 528 FLD. 20/9
(AFOSR-66-0226)
AD-628 529 FLD. 10/1

•AF 49(638)-1124
STANFORD RESEARCH INST MENLO PARK CALIF
(AFOSR-65-2492)
AD-628 715 FLD. 20/11

•AF 99(638)-1138
AEROCHEM RESEARCH LABS INC
PRINCETON N J
AEROCHEM-TP-126
(AFOSR-65-2943)
F AD-628 132 FLD. 20/4
(AFOSR-65-2989)
AD-628 276 FLD. 11/2

•AF 99(638)-1150
GEOTECH DIV TELEDYNE INDUSTRIES INC
GARLAND TEX
TR-66-13
AD-628 883 FLD. 8/11

•AF 99(638)-1156
ARECIBO IONOSPHERIC OBSERVATORY
PUERTO RICO
(AFOSR-65-2269)
AD-628 197 FLD. 3/2
(AFOSR-65-2813)
AD-628 272 FLD. 4/1
(AFOSR-65-2878)
AD-628 273 FLD. 20/9

•AF 99(638)-1170
MICHIGAN UNIV ANN ARBOR INST OF
SCIENCE AND TECHNOLOGY
(AFOSR-65-2910)
AD-628 275 FLD. 8/11

•AF 99(638)-1174
GENERAL ELECTRIC CO PHILADELPHIA
PA MISSILE AND SPACE DIV
(AFOSR-65-1732)
F AD-628 916 FLD. 20/9

•AF 99(638)-1195
AEROCHEM RESEARCH LABS INC
PRINCETON N J
(AFOSR-65-2989)
AD-628 276 FLD. 11/2
(AFOSR-65-2999)
AD-628 282 FLD. 11/2
AEROCHEM TP-124
(AFOSR-66-0146)
F AD-628 915 FLD. 11/2

•AF 99(638)-1222
ATOMICS INTERNATIONAL CANOGA PARK
CALIF
AI-65-120
(AFOSR-65-1914)
F AD-628 187 FLD. 20/9

•AF 99(638)-1242
RIAS INC BALTIMORE MD
(AFOSR-65-2327)
AD-628 719 FLD. 12/2

•AF 99(638)-1244
TEXAS INSTRUMENTS INC DALLAS
SCIENCE SERVICES DIV
F AD-628 985 FLD. 8/11

•AF 99(638)-1259
ANALYTIC SERVICES INC FALLS CHURCH
VA
R-12860
F AD-628 944 FLD. 9/9

•AF 99(638)-1282
TUFTS UNIV MEDFORD MASS INST FOR
PSYCHOLOGICAL RESEARCH
(AFOSR-65-2678)
AD-628 717 FLD. 5/10

•AF 99(638)-1306
PRINCETON UNIV N J DEPT OF
AEROSPACE AND MECHANICAL
SCIENCES
(AFOSR-65-2980)
AD-628 258 FLD. 20/11

•AF 99(638)-1314
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF MECHANICAL
ENGINEERING
(AFOSR-65-2675)
AD-628 216 FLD. 20/11

•AF 99(638)-1319
MICHIGAN UNIV ANN ARBOR DEPT OF
AERONAUTICAL AND ASTRONAUTICAL
ENGINEERING
(AFOSR-65-2478)
AD-628 292 FLD. 20/9

•AF 99(638)-1341
STANFORD UNIV CALIF DEPT OF
CHEMISTRY
(AFOSR-65-2397)
AD-628 283 FLD. 6/1

•AF 99(638)-1359
ADVANCED KINETICS INC COSTA MESA
CALIF
(AFOSR-65-2276)
AD-628 044 FLD. 20/6

•AF 99(638)-1379
THOMAS J WATSON RESEARCH CENTER
YORKTOWN HEIGHTS N Y
(AFOSR-65-2580)
AD-628 728 FLD. 20/12

•AF 99(638)-1380
HARVARD UNIV CAMBRIDGE MASS
(AFOSR-65-2792)
AD-628 288 FLD. 20/8
(AFOSR-65-2801)
AD-628 293 FLD. 20/10

•AF 99(638)-1402
POLYTECHNIC INST OF BROOKLYN N Y
MICROWAVE RESEARCH INST
PIBMRI-1285-65
AD-628 355 FLD. 20/6
POLYTECHNIC INST OF BROOKLYN
FARMINGDALE N Y DEPT OF
ELECTRICAL ENGINEERING
(AFOSR-65-2102)
AD-628 296 FLD. 12/2

•AF 99(638)-1409
OKLAHOMA UNIV NORMAN
(AFOSR-65-2879)
AD-628 348 FLD. 7/4

•AF 99(638)-1435
GENERAL ATOMIC SAN DIEGO CALIF
GA-6749
(AFOSR-65-2210)
A AD-628 066 FLD. 7/4

•AF 99(638)-1445
STD RESEARCH CORP PASADENA CALIF
(AFOSR-65-2504)
AD-628 347 FLD. 20/3

•AF 99(638)-1447
CALIFORNIA INST OF TECH PASADENA
DIV OF BIOLOGY
(AFOSR-65-2751)
AD-628 727 FLD. 6/3

•AF 99(638)-1455
MARTIN CO BALTIMORE MD
RR-70
(AFOSR-66-0007)
F AD-628 799 FLD. 11/6

•AF 99(638)-1458
IIT RESEARCH INST CHICAGO ILL
TECHNOLOGY CENTER
IITRI-H6015-1
(AFOSR-66-0181)
F AD-628 319 FLD. 9/2

•AF 99(638)-1468
GENERAL ELECTRIC CO PHILADELPHIA
PA MISSILE AND SPACE DIV
(AFOSR-65-2237)
F AD-628 065 FLD. 20/9

•AF 99(638)-1468
BELL TELEPHONE LABS INC MURRAY
HILL N J
(AFOSR-65-2567)
AD-628 189 FLD. 20/3
NATIONAL MAGNET LAB MASS INST OF
TECH CAMBRIDGE
(AFOSR-65-2587)
AD-628 259 FLD. 20/3
(AFOSR-65-2027)
AD-628 338 FLD. 20/3
(AFOSR-65-2030)
AD-628 344 FLD. 20/3
(AFOSR-65-2566)
AD-628 345 FLD. 20/3
(AFOSR-65-2555)
AD-628 346 FLD. 20/12

•AF 99(638)-1484
WESTAT RESEARCH ANALYSTS INC
DENVER COLO
(AFOSR-66-0171)
F AD-628 191 FLD. 5/2

•AF 99(638)-1497
JOHNS HOPKINS UNIV BALTIMORE MD
(AFOSR-65-2804)
AD-628 349 FLD. 7/4

•AF 99(638)-1535
TRG INC MELVILLE N Y
(AFOSR-65-2969)
AD-628 253 FLD. 20/5

•AF 99(638)-1599
INSTRUMENTATION RESEARCH LAB
STANFORD UNIV PALO ALTO CALIF
IRL-1038
(AFOSR-0325)
AD-628 780 FLD. 9/2

•AF 99(638)-1700
RAND CORP SANTA MONICA CALIF
RM-4772-PR
AD-628 096 FLD. 12/2
RM-4872-PR
AD-628 329 FLD. 20/10
RM-4871-PR
AD-628 330 FLD. 20/10
RM-4783-PR
AD-628 361 FLD. 12/2
RM-4837-PR
AD-628 554 FLD. 17/9
RM-4865-PR
AD-628 616 FLD. 20/14
RM-4657-PR
AD-628 629 FLD. 12/2
RM-4880-PR
AD-628 626 FLD. 12/1
RM-4897-PR
AD-628 737 FLD. 20/14

•AF 61(052)-274
NORWEGIAN METEOROLOGICAL INST
BLINDERN
(AFCRL-66-113)
F AD-628 820 FLD. 4/2

•AF 61(052)-402
SYSTEM RESEARCH LTD RICHMOND
(ENGLAND)
(AFOSR-65-2666)
AD-628 141 FLD. 6/4

•AF 61(052)-428
TECHNION - ISRAEL INST OF TECH
HAIFA DEPT OF CHEMISTRY
(AFOSR-65-2547)
AD-628 720 FLD. 7/4

•AF 61(052)-490
INNSBRUCK UNIV (AUSTRIA)
(AFCRL-66-36)
AD-628 771 FLD. 20/14

•AF 61(052)-505
INSTITUT NATIONAL DES TECHNIQUES DE
LA DOCUMENTATION PARIS (FRANCE)
(AFOSR-65-2720)
F AD-628 183 FLD. 5/2

•AF 61(052)-587
LIEGE UNIV (BELGIUM) DEPT OF
ASTROPHYSICS
TN-9
(AFCRL-66-111)
AD-628 813 FLD. 3/2
TN-10

(AFCRL-66-112)
AD-628 819 FLD. 3/2

*AF 61(052)-991
GENOA UNIV (ITALY) ISTITUTO GEOFISICO E GEODETICO
(AFCRL-66-39)
F AD-628 809 FLD. 20/14

*AF 61(052)-995
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS
AFCRL-SP-33
AD-628 879 FLD. 4/1

*AF 61(052)-609
KIRUNA GEOPHYSICAL OBSERVATORY (SWEDEN)
(AFCRL-66-34)
F AD-628 761 FLD. 3/2

*AF 61(052)-631
CENTRE NATIONAL D'ETUDES DES TELECOMMUNICATIONS ISSY-LES-MOULINEAUX (FRANCE)
(AFCRL-66-90)
F AD-628 816 FLD. 20/14

*AF61(052)-640
SYSTEM RESEARCH LTD RICHMOND (ENGLAND)
(AFOSR-69-2666)
AD-628 141 FLD. 6/4

*AF 61(052)-678
KIRUNA GEOPHYSICAL OBSERVATORY (SWEDEN)
SCIENTIFIC-10
(AFCRL-66-125)
AD-628 817 FLD. 4/1

*AF 61(052)-701
UPPSALA UNIV (SWEDEN) QUANTUM CHEMISTRY GROUP
SCIENTIFIC-44
(ARL-66-0021)
AD-628 315 FLD. 20/10
(ARL-66-0022)
F AD-628 316 FLD. 20/10
SCIENTIFIC-47
(ARL-66-0037)
AD-628 834 FLD. 20/10
SCIENTIFIC-48
(ARL-66-0035)
AD-628 835 FLD. 7/4

*AF 61(052)-735
TECHNICAL UNIV OF DENMARK LYNGBY IONOSPHERE LAB
19
(AFCRL-66-8)
F AD-628 334 FLD. 4/1

*AF 61(052)-766
UPPSALA UNIV (SWEDEN) GEODETIC INST
(AFCRL-66-76)
AD-628 797 FLD. 8/5

*AF 61(052)-780
QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS
(AFCRL-66-7)
A AD-628 497 FLD. 4/1
(AFCRL-66-7-SUPPL.)
A AD-628 498 FLD. 4/1

*AF 61(052)-811
NORWEGIAN INST OF COSMIC PHYSICS UNIV OF OSLO
(AFCRL-66-9)
AD-628 281 FLD. 4/1
(AFCRL-66-10)
AD-628 748 FLD. 4/1

*AF 61(052)-829
TECHNION - ISRAEL INST OF TECH HAIFA
(ARL-66-0020)
AD-628 921 FLD. 20/12

*AF 61(052)-828
DANISH METEOROLOGICAL INST COPENHAGEN GEOPHYSICAL SECTION
(AFCRL-66-77)
AD-628 802 FLD. 22/2

*AF 61(052)-838
WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL)
TN-3
(AFCRL-66-37)
AD-628 780 FLD. 7/4
SCIENTIFIC-4
(AFCRL-66-38)
AD-628 779 FLD. 7/4

*AF 61(052)-848
SHEFFIELD UNIV (ENGLAND) DEPT OF CHEMISTRY
(AFCRL-66-12)
F AD-628 571 FLD. 7/4

*AF 61(052)-861
TECHNISCHE HOCHSCHULE KARLSRUHE (WEST GERMANY) GEOPHYSIKALISCHES INSTITUT
(AFOSR-69-2939)
AD-628 068 FLD. 8/11

*AF 61(052)-882
MANCHESTER UNIV (ENGLAND) DEPT OF ASTRONOMY
(AFCRL-66-14)
AD-628 557 FLD. 3/2

*AF 61(514)-1128
PISA UNIV (ITALY) ISTITUTO DI FISIOLOGIA
(AFOSR-69-2947)
AD-628 379 FLD. 6/16

*AF-AFOSR-2-63
DELAWARE UNIV NEWARK DEPT OF ELECTRICAL ENGINEERING
TR-941
(AFOSR-69-0027)
AD-628 546 FLD. 9/4

*AF-AFOSR-2-65
DELAWARE UNIV NEWARK DEPT OF ELECTRICAL ENGINEERING
TR-952
(AFOSR-66-0294)
AD-628 711 FLD. 9/4
TR-951
(AFOSR-66-0309)
AD-628 807 FLD. 9/5
TR-953
(AFOSR-66-0308)
AD-628 808 FLD. 9/4

*AF-AFOSR-17-65
MINNESOTA UNIV MINNEAPOLIS HEAT TRANSFER LAB
HTL-TR-65
(AFOSR-69-2724)
AD-628 083 FLD. 20/4

*AF-AFOSR-24-63
ITT FEDERAL LABS NUTLEY N J
(AFOSR-69-2684)
AD-628 827 FLD. 9/2

*AF-AFOSR-30-63
COLORADO UNIV BOULDER DEPT OF PHYSICS
(AFOSR-69-2791)
AD-628 409 FLD. 20/10

*AF-AFOSR-62-7
CORNELL UNIV ITHACA N Y DEPT OF ENGINEERING PHYSICS
(AFOSR-66-0192)
F AD-628 920 FLD. 20/2

*AF-AFOSR-62-13
FLORIDA UNIV GAINESVILLE COLL OF MEDICINE
(AFOSR-69-2681)
AD-628 294 FLD. 6/5

*AF-AFOSR-62-59
PENNSYLVANIA STATE UNIV UNIVERSITY PARK
(AFOSR-69-2627)
AD-628 524 FLD. 12/1

*AF-AFOSR-62-68
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
(AFOSR-69-2429)
AD-628 269 FLD. 12/2

*AF-AFOSR-62-72
CASE INST OF TECH CLEVELAND OHIO
(AFOSR-69-2603)
AD-628 931 FLD. 12/1

*AF-AFOSR-62-83
NORTHWESTERN UNIV EVANSTON ILL
(AFOSR-66-0153)
F AD-628 328 FLD. 7/5

*AF-AFOSR-62-152
ITT FEDERAL LABS NUTLEY N J
(AFOSR-69-2684)
AD-628 827 FLD. 9/2

*AF-AFOSR-62-159
ARKANSAS UNIV FAYETTEVILLE DEPT OF PHYSICS
(AFOSR-69-2880)
AD-628 927 FLD. 7/4

*AF-AFOSR-62-175
CALIFORNIA UNIV BERKELEY DEPT OF CHEMISTRY
(AFOSR-66-0185)
F AD-628 297 FLD. 7/3

*AF-AFOSR-62-213
SYRACUSE UNIV N Y DEPT OF CHEMISTRY
1933
(AFOSR-69-1920)
F AD-628 523 FLD. 7/4

*AF-AFOSR-62-317
MASSACHUSETTS INST OF TECH CAMBRIDGE LAB FOR INSULATION RESEARCH
(AFOSR-69-2873)
AD-628 705 FLD. 20/5

*AF-AFOSR-62-319
IOWA ENGINEERING EXPERIMENT STATION AMES
(AFOSR-69-2828)
AD-628 926 FLD. 7/4
(AFOSR-69-2862)
AD-628 830 FLD. 7/4

*AF-AFOSR-62-334
BRAZIL UNIV RIO DE JANEIRO INSTITUTO DE MATEMATICA PURA E APLICADA
(AFOSR-69-2620)
AD-628 925 FLD. 12/1

*AF-AFOSR-62-386
NEW YORK UNIV N Y DEPT OF PHYSICS
(AFOSR-69-2827)
AD-628 525 FLD. 20/4

*AF-AFOSR-62-391
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION SYDNEY (AUSTRALIA) DIV OF PHYSICS
(AFOSR-69-2597)
AD-628 423 FLD. 20/13
(AFOSR-69-2598)
AD-628 424 FLD. 20/12

*AF-AFOSR-62-400
NEW SOUTH WALES UNIV KENSINGTON (AUSTRALIA)
(AFOSR-69-2997)
AD-628 521 FLD. 12/1
(AFOSR-69-2698)
AD-628 922 FLD. 12/1

•AF-AFOSR-62-907
MASSACHUSETTS INST OF TECH
CAMBRIDGE AEROPHYSICS LAB
TR-119
(AFOSR-66-0129)
AD-628 947 FLD. 20/13

•AF-AFOSR-62-914
CARNEGIE INST OF TECH PITTSBURGH PA
(AFOSR-65-2622)
AD-628 911 FLD. 12/1
(AFOSR-65-2621)
AD-628 912 FLD. 12/1

•AF-AFOSR-62-918
POMONA COLL CLAREMONT CALIF
(AFOSR-65-2825)
AD-628 749 FLD. 20/6

•AF-AFOSR-62-920
INSTITUTE OF GEOPHYSICS AND PLANETARY PHYSICS UNIV OF CALIFORNIA SAN DIEGO
(AFOSR-65-2899)
AD-628 829 FLD. 8/11

•AF-AFOSR-63-69
SOREQ RESEARCH ESTABLISHMENT ISRAEL ATOMIC ENERGY COMMISSION YAVNEH IA-897
(AFOSR-65-2305)
AD-628 901 FLD. 20/12

•AF-AFOSR-65-63
NORTH DAKOTA STATE UNIV FARGO
(AFOSR-65-2071)
AD-628 826 FLD. 7/2

•AF-AFOSR-68-63
LOUISIANA STATE UNIV BATON ROUGE
DEPT OF MATHEMATICS
(AFOSR-65-2181)
AD-628 397 FLD. 12/1

•AF-AFOSR-82-65
CALIFORNIA UNIV LOS ANGELES
(AFOSR-65-2802)
AD-628 828 FLD. 3/2
CALIFORNIA UNIV LOS ANGELES DEPT OF ASTRONOMY
(AFOSR-65-2806)
AD-628 956 FLD. 4/2
(AFOSR-65-2807)
AD-628 957 FLD. 4/2

•AF-AFOSR-100-63
NORTHWESTERN UNIV EVANSTON ILL
TECHNOLOGICAL INST
(AFOSR-2484)
AD-628 736 FLD. 20/11

•AF-AFOSR-100-64
NORTHWESTERN UNIV EVANSTON ILL
TECHNOLOGICAL INST
(AFOSR-65-2483)
AD-628 702 FLD. 20/11
(AFOSR-65-2482)
AD-628 738 FLD. 20/11

•AF-AFOSR-107-64
CHARGED PARTICLE RESEARCH LAB UNIV OF ILLINOIS URBANA
(AFOSR-65-2498)
AD-628 951 FLD. 13/7

•AF-AFOSR-121-63
CALIFORNIA UNIV BERKELEY DEPT OF MATHEMATICS
(AFOSR-65-2604)
AD-628 703 FLD. 12/1

•AF-AFOSR-124-63
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY
(AFOSR-65-2378)
AD-628 902 FLD. 7/3

•AF-AFOSR-139-64
CALIFORNIA UNIV BERKELEY
ELECTRONICS RESEARCH LAB
ERL-65-31
AD-628 677 FLD. 9/5

•AF-AFOSR-139-65
CALIFORNIA UNIV BERKELEY
ELECTRONICS RESEARCH LAB
ERL-65-31
AD-628 677 FLD. 9/5

•AF-AFOSR-153-63
NORTH CAROLINA UNIV CHAPEL HILL
INST OF FIELD PHYSICS
F AD-628 256 FLD. 20/10

•AF-AFOSR-156-64
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF AERONAUTICS AND ASTRONAUTICS
(AFOSR-65-2471)
AD-628 952 FLD. 20/4

•AF-AFOSR-219-63
MINNESOTA UNIV MINNEAPOLIS
(AFOSR-66-0286)
AD-628 982 FLD. 12/1

•AF-AFOSR-221-63
WISCONSIN UNIV MADISON
(AFOSR-65-2702)
F AD-628 089 FLD. 11/6

•AF-AFOSR-228-63
COLUMBIA UNIV NEW YORK
(AFOSR-65-2956)
AD-628 904 FLD. 20/12

•AF-AFOSR-246-63
CALIFORNIA UNIV LOS ANGELES BRAIN RESEARCH INST
(AFOSR-65-2838)
AD-628 903 FLD. 6/16

•AF-AFOSR-252-63
OKLAHOMA UNIV NORMAN DEPT OF PHYSICS
(AFOSR-65-2829)
AD-628 229 FLD. 7/4
(AFOSR-65-2882)
AD-628 906 FLD. 7/4
(AFOSR-65-2954)
AD-628 907 FLD. 7/4

•AF-AFOSR-271-63
STATE UNIV OF NEW YORK BUFFALO
DEPT OF CHEMISTRY
(AFOSR-65-2384)
AD-628 910 FLD. 7/4

•AF-AFOSR-273-64
TEXAS UNIV AUSTIN DEPT OF PHYSICS
(AFOSR-65-2906)
AD-628 947 FLD. 7/4
(AFOSR-65-2907)
AD-628 948 FLD. 7/4

•AF-AFOSR-281-63A
OREGON STATE UNIV CORVALLIS DEPT OF CHEMISTRY
(AFOSR-65-2231)
F AD-628 060 FLD. 7/4

•AF-AFOSR-310-63
SAO PAULO UNIV (BRAZIL)
(AFOSR-65-2695)
AD-628 698 FLD. 20/8

•AF-AFOSR-314-63
BUENOS AIRES UNIV (ARGENTINA)
INSTITUTO DE ANATOMIA GENERAL Y EMBRIOLOGIA
(AFOSR-65-2835)
AD-628 937 FLD. 6/16
(AFOSR-65-2836)
AD-628 938 FLD. 6/16

•AF-AFOSR-324-63
CORNELL UNIV ITHACA N Y DEPT OF CHEMISTRY
(AFOSR-65-2955)
AD-628 395 FLD. 7/4

•AF-AFOSR-326-63
TEXAS A AND M UNIV COLLEGE STATION
DEPT OF PHYSICS
(AFOSR-65-2863)
AD-628 913 FLD. 7/4

•AF-AFOSR-330-63
COLUMBIA RADIATION LAB NEW YORK
(AFOSR-66-0166)
F AD-628 082 FLD. 7/4

•AF-AFOSR-337-63
INSTITUTE FOR ADVANCED STUDY
PRINCETON N J
(AFOSR-65-2615)
AD-628 392 FLD. 12/1
(AFOSR-65-2616)
AD-628 393 FLD. 12/1

•AF-AFOSR-361-65
WINDSOR UNIV (ONTARIO) DEPT OF PHYSICS
(AFOSR-65-2861)
AD-628 749 FLD. 7/3

•AF-AFOSR-378-63
LASH MILLER CHEMICAL LABS UNIV OF TORONTO (ONTARIO)
SCIENTIFIC-1
(AFOSR-65-2723)
AD-628 228 FLD. 7/4

•AF-AFOSR-381-63
MINNESOTA UNIV MINNEAPOLIS
(AFOSR-65-2624)
AD-628 938 FLD. 12/1
(AFOSR-65-2625)
AD-628 939 FLD. 12/1

•AF-AFOSR-406-63
PRINCETON UNIV N J
(AFOSR-65-2474)
AD-628 398 FLD. 20/11

•AF-AFOSR-415-63
COMMUNICATION RESEARCH INST MIAMI FLA
(AFOSR-65-2995)
AD-628 908 FLD. 8/1

•AF-AFOSR-430-63
MICHIGAN STATE UNIV EAST LANSING
(AFOSR-65-2572)
AD-628 742 FLD. 20/12

•AF-AFOSR-445-63
CATHOLIC UNIV OF AMERICA
WASHINGTON D C
(AFOSR-65-2816)
AD-628 900 FLD. 20/3

•AF-AFOSR-493-63
POLYTECHNIC INST OF BROOKLYN
FARMINGDALE N Y
(AFOSR-65-2451)
AD-628 729 FLD. 20/9

•AF-AFOSR-478-65
ROCHESTER UNIV N Y DEPT OF MECHANICAL AND AEROSPACE SCIENCES
(AFOSR-66-0169)
F AD-628 143 FLD. 20/9

•AF-AFOSR-496-64
UNIVERSITY OF SOUTHERN CALIFORNIA
LOS ANGELES DEPT OF PHYSICS
(AFOSR-65-2734)
AD-628 945 FLD. 20/12

•AF-AFOSR-496-65
UNIVERSITY OF SOUTHERN CALIFORNIA
LOS ANGELES DEPT OF ELECTRICAL ENGINEERING
(AFOSR-65-2449)
AD-628 697 FLD. 12/1

•AF-AFOSR-508-64
BELFER GRADUATE SCHOOL OF SCIENCE
YESHIVA UNIV NEW YORK
(AFOSR-65-2865)
AD-628 252 FLD. 20/8

•AF-AFOSR-524-69
NORTHWESTERN UNIV EVANSTON ILL
(AFOSR-66-0153)
F AD-628 328 FLD. 7/5

•AF-AFOSR-525-69
BATTELLE MEMORIAL INST COLUMBUS OHIO
(AFOSR-65-2105)
AD-628 437 FLD. 20/12

•AF-AFOSR-544-69
CALIFORNIA UNIV BERKELEY DEPT OF CHEMISTRY
(AFOSR-66-0185)
F AD-628 297 FLD. 7/3

•AF-AFOSR-568-65
NEW MEXICO UNIV ALBUQUERQUE BUREAU OF ENGINEERING RESEARCH
TR-ME-17
(AFOSR-65-2676)
AD-628 790 FLD. 20/11

•AF-AFOSR-569-69
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
1776-1
(AFOSR-66-0175)
F AD-628 137 FLD. 7/3

•AF-AFOSR-594-69
WASHINGTON UNIV SEATTLE
(AFOSR-65-2571)
AD-628 824 FLD. 20/8
(AFOSR-65-2597)
AD-628 825 FLD. 20/8

•AF-AFOSR-610-69
CALIFORNIA UNIV LA JOLLA DEPT OF PHYSICS
(AFOSR-65-2534)
AD-628 434 FLD. 20/3
(AFOSR-65-2542)
AD-628 436 FLD. 20/8

•AF-AFOSR-631-69
CALIFORNIA UNIV LA JOLLA
(AFOSR-65-2936)
AD-628 822 FLD. 20/12

•AF-AFOSR-641-69
MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB
TR-127
(AFOSR-65-2713)
F AD-628 233 FLD. 20/4
TR-119
(AFOSR-66-0129)
AD-628 547 FLD. 20/13

•AF-AFOSR-660-69
TASMANIA UNIV HOBART (AUSTRALIA) DEPT OF MATHEMATICS
(AFOSR-65-2926)
AD-628 432 FLD. 12/1

•AF-AFOSR-693-69
BROWN UNIV PROVIDENCE R I
(AFOSR-65-2130)
AD-628 696 FLD. 12/2
(AFOSR-65-2129)
AD-628 699 FLD. 12/2
(AFOSR-65-2128)
AD-628 700 FLD. 12/2
(AFOSR-65-2127)
AD-628 709 FLD. 12/2
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
TR-69-5
(AFOSR-65-2317)
AD-628 274 FLD. 12/1

•AF-AFOSR-771-65
WASHINGTON UNIV ST LOUIS MO DEPT OF PHYSICS
(AFOSR-66-0167)
F AD-628 138 FLD. 7/4

•AF-AFOSR-772-65
NOTRE DAME UNIV IND DEPT OF CHEMISTRY
(AFOSR-65-2389)
AD-628 454 FLD. 7/3

•AF-AFOSR-804-65
TEXAS UNIV AUSTIN DEPT OF CHEMICAL ENGINEERING
(AFOSR-65-2539)
AD-628 455 FLD. 20/12

•AF-AFOSR-931-65
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
R-279
AD-628 113 FLD. 9/5

•AF-EOAR-1-63
MAUDSLEY HOSPITAL LONDON (ENGLAND)
(AFOSR-65-2839)
AD-628 358 FLD. 6/16

•AF-EOAR-2-63
UNIVERSITY COLL LONDON (ENGLAND) DEPT OF ANATOMY
(AFOSR-65-2841)
AD-628 370 FLD. 6/3

•AF-EOAR-5-64
LUND UNIV (SWEDEN)
(AFOSR-65-2511)
AD-628 740 FLD. 6/16

•AF-EOAR-8-64
SHEFFIELD UNIV (ENGLAND) DEPT OF BIOCHEMISTRY
(AFOSR-65-2188)
AD-628 821 FLD. 6/1

•AF-EOAR-8-65
PARMA UNIV (ITALY) INST OF HUMAN PHYSIOLOGY
IHP-65-2
(AFOSR-66-0176)
F AD-628 081 FLD. 6/16

•AF-EOAR-9-63
PISA UNIV (ITALY) ISTITUTO DI FISIOLOGIA
(AFOSR-65-2963)
AD-628 352 FLD. 6/16
(AFOSR-65-2962)
AD-628 354 FLD. 6/16

•AF-EOAR-11-65
VON KARMAN INST FOR FLUID DYNAMICS RHODE-SAINT-GENESE (BELGIUM)
(AFOSR-65-2715)
F AD-628 182 FLD. 20/4

•AF-EOAR-13-63
CENTRE D'ETUDES DE PHYSIOLOGIE NERVEUSE ET D'ELECTROPHYSIOLOGIE PARIS (FRANCE)
(AFOSR-65-2830)
AD-628 368 FLD. 6/16

•AF-EOAR-20-65
BRUSSELS UNIV (BELGIUM) LABORATOIRE DE GENETIQUE
(AFOSR-66-0178)
F AD-628 325 FLD. 6/13

•AF-EOAR-25-63
STOCKHOLM UNIV (SWEDEN) DEPT OF ZOOLOGY
(AFOSR-66-0179)
F AD-628 322 FLD. 6/3

•AF-EOAR-25-65
TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF PHYSICS
(AFOSR-65-2554)
AD-628 375 FLD. 20/8

•AF-EOAR-28 63
GOTEBORG UNIV (SWEDEN) INST OF NEUROBIOLOGY
(AFOSR-65-2517)
AD-628 365 FLD. 6/1
(AFOSR-65-2518)
AD-628 366 FLD. 6/1

•AF-EOAR-29-63
PISA UNIV (ITALY)
(AFOSR-65-2739)
AD-628 350 FLD. 12/1

•AF-EOAR-30-64
GOTEBORG UNIV (SWEDEN) DEPT OF PHARMACOLOGY
(AFOSR-65-2854)
AD-628 741 FLD. 6/16

•AF-EOAR-32-64
OSLO UNIV (NORWAY) INST FOR THEORETICAL PHYSICS
INSTITUTE-28
(AFOSR-65-2754)
AD-628 414 FLD. 20/10

•AF-EOAR 36-63
GLASGOW UNIV (SCOTLAND) DEPT OF CHEMISTRY
SCIENTIFIC-2
AD-628 733 FLD. 7/3

•AF-EOAR-41-64
CLEVITE CORP BEDFORD OHIO PIEZOELECTRIC DIV
(AFOSR-65-2524)
AD-628 340 FLD. 6/16

•AF-EOAR-42-63
LOUVAIN UNIV (BELGIUM) LAB OF INORGANIC CHEMISTRY
(AFOSR-65-2240)
F AD-628 144 FLD. 21/2

•AF-EOAR-42-64
UNIVERSITY COLL LONDON (ENGLAND)
(AFOSR-65-2525)
AD-628 743 FLD. 6/3

•AF-EOAR-46-64
IMPERIAL COLL OF SCIENCE AND TECHNOLOGY LONDON (ENGLAND) DEPT OF PHYSICS
(AFOSR-65-2958)
AD-628 342 FLD. 20/8
(AFOSR-65-2799)
AD-628 343 FLD. 20/10
(AFOSR-65-2694)
AD-628 739 FLD. 20/10

•AF-EOAR-51-64
HOPITAL HENRI ROUSSELLE PARIS (FRANCE) LABORATOIRE DE NEUROPHYSIOLOGIE
(AFOSR-66-0810)
F AD-628 298 FLD. 6/16

•AF-EOAR-52-65
KAROLINSKA INSTITUTET STOCKHOLM (SWEDEN) DEPT OF PHYSIOLOGY
(AFOSR-65-2510)
AD-628 115 FLD. 6/16

•AF-EOAR-58-63
TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF AERONAUTICAL ENGINEERING
SCIENTIFIC-3
(AFOSR-65-2753)
AD-628 174 FLD. 20/11

•AF-EOAR-61-64
TRINITY COLL DUBLIN (EIRE) SCHOOL OF MATHEMATICS
(AFOSR-65-2953)
AD-628 339 FLD. 20/8
(AFOSR-65-2870)
AD-628 341 FLD. 20/8

•AF-EOAR-62-9
PISA UNIV (ITALY) ISTITUTO DI FISIOLOGIA
(AFOSR-65-2946)
AD-628 376 FLD. 6/3
(AFOSR-65-2948)
AD-628 378 FLD. 6/16
(AFOSR-65-2947)
AD-628 379 FLD. 6/16

•AF-EOAR-62-16
BRUSSELS UNIV (BELGIUM)
(AFOSR-65-2877)
AD-628 373 FLD. 20/8
(AFOSR-65-2881)
AD-628 374 FLD. 20/8

•AF-EOAR-62-37
UNIVERSITY COLL LONDON (ENGLAND) DEPT OF ANATOMY
(AFOSR-65-2654)
F AD-628 237 FLD. 6/3

•AF-EOAR-62-45
MEDICAL RESEARCH COUNCIL OXFORD (ENGLAND) CELL METABOLISM RESEARCH UNIT
(AFOSR-65-2973)
AD-628 391 FLD. 6/13

•AF-EOAR-62-68
QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF PHYSICS
(ARL-66-0019)
F AD-628 327 FLD. 20/9

•AF-EOAR-62-77
LEICESTER UNIV (ENGLAND) DEPT OF BIOCHEMISTRY
(AFOSR-65-2971)
AD-628 390 FLD. 6/1

•AF-EOAR-62-79
EDINBURGH UNIV (SCOTLAND)
(AFOSR-65-2949)
AD-628 389 FLD. 6/16

•AF-EOAR-63-69
HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF PHYSICS
(AFOSR-65-2545)
AD-628 362 FLD. 20/2
(AFOSR-65-2544)
AD-628 363 FLD. 20/12

•AF-EOAR-63-68
FREIE UNIVERSITAET BERLIN (WEST GERMANY) PHYSIOLOGISCHES INSTITUT
(AFOSR-65-2964)
AD-628 372 FLD. 6/16

•AF-EOAR-64-66
LYON UNIV (FRANCE) DEPT OF EXPERIMENTAL MEDICINE
(AFOSR-65-2655)
F AD-628 246 FLD. 6/16

•AF-EOAR-65-66
LOUVAIN UNIV (BELGIUM)
(AFOSR-65-2740)
AD-628 247 FLD. 22/2

•AF-EOAR-72-63
WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL) DEPT OF APPLIED MATHEMATICS
(AFOSR-65-2213-PT-1)
F AD-628 179 FLD. 20/9
(AFOSR-65-2213-PT-3)
F AD-628 181 FLD. 20/9

•AF-EOAR-74-64
QUEEN MARY COLL UNIV OF LONDON (ENGLAND)
SCIENTIFIC-5
(AFCRL-66-6)
AD-628 320 FLD. 8/14

•AF-EOAR-75-63
WEIZMANN INST OF SCIENCE REHOVOTH (ISRAEL) DEPT OF APPLIED MATHEMATICS
(AFOSR-65-2213-PT-2)
F AD-628 180 FLD. 20/9

•AF-EOAR-78-63
ELIEZER KAPLAN SCHOOL OF ECONOMICS AND SOCIAL SCIENCES HEBREW UNIV JERUSALEM (ISRAEL)
(AFOSR-2292)
AD-628 236 FLD. 5/11

•AF-EOAR-78-64
TECHNION - ISRAEL INST OF TECH HAIFA
(AFOSR-65-2493)
AD-628 061 FLD. 20/9

•AF-EOAR-98-63
POLITECNICO DI TORINO (ITALY) ISTITUTO DI MECCANICA APPLICATA
SCIENTIFIC-7
(AFOSR-65-2294)
AD-628 142 FLD. 20/4

•AF-EOAR-109-63
BASEL UNIV (SWITZERLAND) INST OF PHYSICS
(AFCRL-66-35)
AD-628 818 FLD. 7/4

•ARPA ORDER-193-65
GEOLOGICAL SURVEY DENVER COLO
TL-42
AD-628 163 FLD. 8/7

•ARPA ORDER-246
STANFORD UNIV CALIF DEPT OF MECHANICAL ENGINEERING
(AFOSR-66-0225)
AD-628 528 FLD. 20/9
(AFOSR-66-0226)
AD-628 529 FLD. 10/1

•ARPA ORDER-292
LAMONT GEOLOGICAL OBSERVATORY PALISADES N Y
SCIENTIFIC-5
(AFCRL-66-69)
AD-628 498 FLD. 8/11

•ARPA ORDER-292-63
TEXAS INSTRUMENTS INC DALLAS SCIENCE SERVICES DIV
F AD-628 385 FLD. 8/11

•ARPA ORDER-302-62
TYCO LABS INC WALTHAM MASS
F AD-628 071 FLD. 10/2

•ARPA ORDER-306
WESTINGHOUSE ELECTRIC CORP BALTIMORE MD
MDE-6236
AD-628 489 FLD. 20/5

•ARPA ORDER-306-62
GENERAL PRECISION INC LITTLE FALLS N J AEROSPACE GROUP
AD-628 526 FLD. 20/5

•ARPA ORDER-306-64
MICROWAVE LAB STANFORD UNIV CALIF
ML-1393
AD-628 076 FLD. 20/5

•ARPA ORDER-386
AERONUTRONIC DIV PHILCO CORP NEWPORT BEACH CALIF
U-3452
AD-628 245 FLD. 6/3

•ARPA ORDER-400
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
TR-2-702
F AD-628 734 FLD. 8/13

•ARPA ORDER-490
BLOCK ENGINEERING INC CAMBRIDGE MASS
(AFCRL-66-94)
F AD-628 784 FLD. 17/8

•ARPA ORDER-512
LINCOLN LAB MASS INST OF TECH LEXINGTON
TN-1965-64
(ESD-TDR-65-596)
AD-628 148 FLD. 8/11

•ARPA ORDER-600
LINCOLN LAB MASS INST OF TECH LEXINGTON
TN-1966-14
(ESD-TDR-66-32)
AD-628 493 FLD. 20/6
TN-1966-4
(ESD-TDR-66-19)
AD-628 494 FLD. 5/8

•AT(11-1)-GEN-10
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
REPT. NO. 65-57
AD-628 169 FLD. 9/2
66-4
AD-628 220 FLD. 9/2

•AT(30-1)-1807
YALE UNIV NEW HAVEN CONN
(AFOSR-TN-60-615)
AD-628 267 FLD. 20/8

•DA-11-022-AMC-1775(X)
IIT RESEARCH INST CHICAGO ILL TECHNOLOGY CENTER
IITRI-U6012-4
F AD-628 584 FLD. 6/1

•DA-18-108-AMC-115(A)
WESTINGHOUSE RESEARCH LABS PITTSBURGH PA
AD-628 173 FLD. 15/2

•DA-19-129-AMC-2103
PILLSBURY MILLS INC MINNEAPOLIS MINN
F AD-628 377 FLD. 6/8

•DA-28-043-AMC-00052(E)
HUGHES AIRCRAFT CO NEWPORT BEACH CALIF
F AD-628 229 FLD. 9/1

•DA-28-043-AMC-00073(E)
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
R-275
AD-628 111 FLD. 22/3
R-278
AD-628 112 FLD. 12/2
R-279
AD-628 113 FLD. 9/5
REPT. NO. R-280
AD-628 114 FLD. 20/3
R-274
AD-628 208 FLD. 22/3
R-276
AD-628 317 FLD. 20/9

•DA-28-043-AMC-00099(E)
COLUMBIA RADIATION LAB NEW YORK
CU-12-65-AMC-00099(E)
AD-628 089 FLD. 7/4

•DA-28-043-AMC-00278(E)
MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
F AD-628 131 FLD. 9/1

•DA-28-043-AMC-00320(E)
PRATT AND WHITNEY AIRCRAFT EAST HARTFORD CONN
AD-628 159 FLD. 10/2

•DA-28-043-AMC-00392(E)
TRAVELERS RESEARCH CENTER INC HARTFORD CONN
TRC-7965-194
(ECOM-00392-F)
F AD-628 730 FLD. 9/2

•DA-28-043-AMC-00454(E)
RADIO CORP OF AMERICA CAMDEN N J COMMUNICATIONS SYSTEMS DIV
AD-628 117 FLD. 9/5

•DA-28-043-AMC-01230(E)
RADIO CORP OF AMERICA CAMDEN N J DEFENSE ELECTRONIC PRODUCTS
CR-65-419-23

AD-628 130 FLD. 9/1

•DA-28-043-AMC-01286(E)
SPERRY MICROWAVE ELECTRONICS CO CLEARWATER FLA
SJ-220-0059-1
(ECOM-01286-1)
AD-628 271 FLD. 9/5

•DA-28-043-AMC-01291(E)
PENNSYLVANIA UNIV PHILADELPHIA ELECTRO-CHEMISTRY LAB
AD-628 171 FLD. 10/2

•DA-28-043-AMC-01372(E)
MICROWAVE ELECTRONICS CORP PALO ALTO CALIF
AD-628 769 FLD. 9/5

•DA-28-043-AMC-01379(E)
UNION CARBIDE CORP PARMA OHIO
AD-628 499 FLD. 10/2

•DA-28-043-AMC-01401(E)
BRIGHT STAR INDUSTRIES CLIFTON N J
AD-628 575 FLD. 10/3

•DA-28-043-AMC-01429(E)
PHILCO CORP LANSDALE PA
PHILCO R-506
AD-628 618 FLD. 9/1

•DA-28-043-AMC-01426(E)
GEORGIA INST OF TECH ATLANTA ENGINEERING EXPERIMENT STATION
A-868-2
(ECOM-01426-2)
AD-628 324 FLD. 9/5

•DA-28-043-AMC-01482(E)
BENDIX RADIO DIV BENDIX CORP BALTIMORE MD
AD-628 577 FLD. 9/1

•DA-28-043-AMC-01542(E)
ELECTRO-VOICE INC BUCHANAN MICH
AD-628 672 FLD. 17/2.1

•DA-30-069-ORD-2152
CITY COLL OF THE CITY OF NEW YORK
(AROD-247:68)
AD-628 511 FLD. 20/9

•DA-31-124-ARO(D)-98
WASHINGTON UNIV ST LOUIS MO
(AROD-3076:8)
AD-628 090 FLD. 12/1

•DA-31-124-ARO(D)-116
PENNSYLVANIA STATE UNIV UNIVERSITY PARK
(AROD-3263:13)
AD-628 716 FLD. 20/11

•DA-31-124-ARO(D)-127
TEXAS A AND M UNIV COLLEGE STATION INST OF STATISTICS
TR-5
(AROD-4177:2)
AD-628 388 FLD. 12/1

•DA-31-124-ARO(D)-128
HARVARD UNIV CAMBRIDGE MASS
(AROD-1617:55)
AD-628 094 FLD. 12/1
(AROD-1617:56)
AD-628 103 FLD. 12/1
(AROD-1617:58)
AD-628 104 FLD. 12/1

•DA-31-124-ARO(D)-143
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MECHANICAL ENGINEERING
(AROD-4266:1)
AD-628 718 FLD. 11/11

•DA-31-124-ARO(D)-146
PRATT AND WHITNEY AIRCRAFT EAST HARTFORD CONN
(AROD-4367:3)
AD-628 623 FLD. 20/11

•DA-31-124-ARO(D)-173
DELAWARE UNIV NEWARK DEPT OF PHYSICS
TR-6
AD-628 122 FLD. 20/12
TR-5
(AROD-4461:5)
AD-628 483 FLD. 20/12

•DA-31-124-ARO(D)-209
COURANT INST OF MATHEMATICAL SCIENCES NEW YORK UNIV N Y
(AROD-247:67)
AD-628 714 FLD. 12/1

•DA-31-124-ARO(D)-231
WICHITA STATE UNIV KANS DEPT OF AERONAUTICAL ENGINEERING
AR-65-1
(AROD-4837:1)
F AD-628 087 FLD. 1/3

•DA-31-124-ARO(D)-251
GATES AND CRELLIN LABS OF CHEMISTRY CALIF INST OF TECH PASADENA
(AROD-3447:1C)
AD-628 722 FLD. 7/4

•DA-31-124-ARO(D)-255
COLUMBIA UNIV NEW YORK ELECTRONICS RESEARCH LABS
(AROD-5132:1)
AD-628 721 FLD. 12/1

•DA-31-124-ARO(D)-266
WISCONSIN UNIV MADISON
(AROD-4936:1)
AD-628 088 FLD. 12/1

•DA-31-124-ARO(D)-277
NORTH CAROLINA STATE UNIV RALEIGH
(AROD-5010:5)
AD-628 696 FLD. 11/6

•DA-31-124-ARO(D)-288
ILLINOIS UNIV URBANA
(AROD-5254:6)
AD-628 620 FLD. 12/1
(AROD-5254:11)
AD-628 621 FLD. 12/1

•DA-31-124-ARO(D)-306
INSTITUTE OF OPTICS UNIV OF ROCHESTER N Y
(AROD-5314:2)
AD-628 724 FLD. 7/5

•DA-31-124-ARO(D)-316
POLYTECHNIC INST OF BROOKLYN FARMINGDALE N Y DEPT OF ELECTRICAL ENGINEERING
(AFOSR-65-2102)
AD-628 296 FLD. 12/2

•DA-31-124-ARO(D)-322
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
SRM-143
AD-628 369 FLD. 12/1

•DA-33-017-CIVENG-87-2
ILLINOIS UNIV URBANA DEPT OF CIVIL ENGINEERING
SRS-137
F AD-628 285 FLD. 13/2

•DA-33-017-ENG-34
ILLINOIS UNIV URBANA DEPT OF CIVIL ENGINEERING
AD-628 196 FLD. 11/6
AD-628 284 FLD. 11/6

•DA-33-017-ENG-221
ILLINOIS UNIV URBANA DEPT OF CIVIL ENGINEERING
AD-628 154 FLD. 11/6

•DA-33-019-AMC-270(Z)
CASE INST OF TECH CLEVELAND OHIO
DEPT OF METALLURGY
(AMRA-CR-64-03/2)
AD-628 387 FLD. 11/6

•DA-36-039-AMC-03270(E)
HICTRON INC ALBANY N Y
F AD-628 093 FLD. 9/1

•DA-36-039-AMC-03629(E)
HAMILTON STANDARD DIV UNITED AIRCRAFT CORP WINDSOR LOCKS CONN
EBR-177
AD-628 170 FLD. 13/8

•DA-36-039-AMC-06156(E)
MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
AD-628 230 FLD. 9/1

•DA-36-039-AMC-06160(E)
TEXAS INSTRUMENTS INC DALLAS SEMICONDUCTOR-COMPONENTS DIV
TI-03-65-122
AD-628 128 FLD. 9/1

•DA-36-039-AMC-06166(E)
GENERAL ELECTRIC CO LYNCHBURG VA COMMUNICATION PRODUCTS DEPT
AD-628 227 FLD. 9/1

•DA-36-039-SC-85188
WISCONSIN UNIV MADISON DEPT OF ELECTRICAL ENGINEERING
AD-628 859 FLD. 9/5

•DA-36-039-SC-85972
VALPEY FISHER CORP HOLLISTON MASS
AD-628 517 FLD. 9/1

•DA-36-039-SC-85976
CTS CORP ELKHART IND RESEARCH AND DEVELOPMENT DIV
AD-628 280 FLD. 14/2

•DA-36-039-SC-89202
TEXAS A AND M UNIV COLLEGE STATION DEPT OF METEOROLOGY
AD-628 768 FLD. 4/2

•DA-36-039-SC-90689
NEW YORK UNIV N Y DEPT OF PHYSICS
F AD-628 861 FLD. 20/6

•DA-44-009-AMC-777(T)
DONALDSON CO INC MINNEAPOLIS MINN RESEARCH AND DEVELOPMENT DIV
AD-628 239 FLD. 13/11

•DA-44-009-AMC-930(T)
HOLMAN (JOHN F) CO INC WASHINGTON D C
AD-628 231 FLD. 7/2
AD-628 232 FLD. 20/6

•DA-44-177-AMC-120(T)
HAYES INTERNATIONAL CORP BIRMINGHAM ALA
1188
(USAAVLABS-TR-66-3)
F AD-628 681 FLD. 11/9

•DA-44-177-AMC-163(T)
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
CAL-BB-1932-S-1
(USAAVLABS-TR-65-74)
F AD-628 983 FLD. 20/4

•DA-44-177-AMC-202(T)
BOWLES ENGINEERING CORP SILVER SPRING MD
F AD-628 676 FLD. 20/4

•DA-44-177-AMC-239(T)
BOEING CO MORTON PA VERTOL DIV
R-383
(USAAVLABS-TR65-72)
AD-628 980 FLD. 1/1

•DA-44-177-AMC-254(T)
AVIATION SAFETY ENGINEERING AND

RESEARCH PHOENIX ARIZ
F AD-628 678 FLD. 6/17
AD-628 679 FLD. 6/17
AD-628 680 FLD. 6/17

•DA-99-177-AMC-892(T)
MISSISSIPPI STATE UNIV STATE COLLEGE DEPT OF AEROPHYSICS AEROPHYSICS RR-60 (USAAVLABS-TR-65-76)
AD-628 675 FLD. 11/9

•DA-99-188-ARO-2
HUMAN RESOURCES RESEARCH OFFICE GEORGE WASHINGTON UNIV ALEXANDRIA VA
TR-66-1
AD-628 944 FLD. 5/9
TR-65-16
AD-628 667 FLD. 19/7
AD-628 819 FLD. 5/10

•DA-99-007-MD-961
WESTERN RESERVE UNIV CLEVELAND OHIO SCHOOL OF MEDICINE
A AD-628 857 FLD. 6/5

•DA-99-059-CIVENG-64-15
NORTHWESTERN UNIV EVANSTON ILL
AD-628 868 FLD. 8/10

•DA-99-196-XZ-10
GEORGE WASHINGTON UNIV WASHINGTON D C
AD-628 978 FLD. 6/5

•DA-99-196-XZ-396
SOUTHWEST RESEARCH INST SAN ANTONIO TEX (DASA-1725)
F AD-628 783 FLD. 13/12

•DA-99-186-AMC-67
VIRGINIA UNIV CHARLOTTESVILLE RESEARCH LABS FOR THE ENGINEERING SCIENCES EMI-3342-102-65U
F AD-628 369 FLD. 14/2

•DA-99-193-MD-2357
BAYLOR UNIV HOUSTON TEX COLL OF MEDICINE
AD-628 723 FLD. 6/5

•DA-99-193-MD-2398
JOHNS HOPKINS UNIV BALTIMORE MD SCHOOL OF HYGIENE AND PUBLIC HEALTH
AD-628 619 FLD. 6/5

•DA-99-193-MD-2446
NATIONAL JEWISH HOSPITAL DENVER COLO
AD-628 713 FLD. 6/14

•DA-99-193-MD-2645
NEW MEXICO UNIV ALBUQUERQUE
F AD-628 069 FLD. 7/3

•DA-99-193-MD-2680
GEORGE WASHINGTON UNIV WASHINGTON D C
AD-628 978 FLD. 6/5

•DA-ARO-99-092-64-G41
UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO MEXICO INSTITUTO DE INGENIERIA
AD-628 910 FLD. 8/13

•DA-ARO-99-092-64-G89
UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO MEXICO INSTITUTO DE INGENIERIA
AD-628 909 FLD. 13/13

•DA-ARO(D)-31-124-G188
SIBLEY SCHOOL OF MECHANICAL ENGINEERING CORNELL UNIV ITHACA N Y (AROD-3199:2)
AD-628 386 FLD. 20/4

•DA-ARO(D)-31-124-G420
NEW YORK UNIV N Y RADIATION AND SOLID STATE LAB
F AD-628 394 FLD. 20/6

•DA-ARO(D)-31-124-G466
INSTITUTE FOR MOLECULAR PHYSICS UNIV OF MARYLAND COLLEGE PARK (AROD-4291:8)
AD-628 660 FLD. 7/4

•DA-ARO(D)-31-124-G491
MASSACHUSETTS UNIV AMHERST DEPT OF CHEMISTRY (AROD-2533:2)
AD-628 659 FLD. 7/3

•DA-ARO(D)-31-124-G521
SYRACUSE UNIV N Y STATE UNIV COLL OF FORESTRY (AROD-4617:1)
AD-628 622 FLD. 7/3

•DA-ARO(D)-31-124-G529
CALIFORNIA UNIV DAVIS DEPT OF CHEMISTRY (AROD-3861:3)
AD-628 086 FLD. 7/5

•DA-ARO(D)-31-124-G530
NEW YORK UNIV N Y DEPT OF PHYSICS
AD-628 550 FLD. 7/4

•DA-ARO(D)-31-124-G534
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST (AROD-4990:1)
AD-628 653 FLD. 20/11

•DA-ARO(D)-31-124-G588
UNIVERSITY OF SOUTH FLORIDA TAMPA DEPT OF CHEMISTRY (AROD-5200:2)
AD-628 692 FLD. 7/3

•DA-ARO(D)-31-124-G607
SLOANE PHYSICS LAB YALE UNIV NEW HAVEN CONN (AROD-893:106)
AD-628 650 FLD. 20/8

•DA-ARO(D)-31-124-G609
ARGONNE NATIONAL LAB ILL (AROD-5103:5)
AD-628 649 FLD. 11/6
ILLINOIS UNIV URBANA (AROD-5103:3)
AD-628 648 FLD. 11/6

•DA-ARO(D)-31-124-G744
VIRGINIA UNIV CHARLOTTESVILLE DEPT OF PHYSICS (AROD-4685:3)
AD-628 657 FLD. 20/6

•DA-ARO(D)-31-124-G746
VIRGINIA POLYTECHNIC INST BLACKSBURG (AROD-2776:19)
AD-628 654 FLD. 12/1
(AROD-2776:13)
AD-628 655 FLD. 12/1

•DRB-9540-02
TORONTO UNIV (ONTARIO)
AD-628 918 FLD. 20/9

•DRB-9390-19
TORONTO UNIV (ONTARIO) DEPT OF MEDICAL BIOPHYSICS
AD-628 962 FLD. 6/16

•MA-1420
TORONTO UNIV (ONTARIO) DEPT OF MEDICAL BIOPHYSICS
AD-628 962 FLD. 6/16

•NOBSR-93306
CHATHAM ELECTRONICS DIV TUNG-SOL ELECTRIC INC LIVINGSTON N J
AD-628 898 FLD. 9/5

•N140(70024)79686B
PARKE MATHEMATICAL LABS INC CARLISLE MASS SCIENTIFIC-3
AD-628 127 FLD. 20/1

•N600(19)61720
MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB TR-118
AD-628 229 FLD. 20/4
TR-119
AD-628 578 FLD. 20/4

•N600(19)62121
LTV VOUGHT AERONAUTICS DIV LING-TEMCO-VOUGHT INC DALLAS TEX 2-53727/6R949-6
F AD-628 581 FLD. 1/3

•N600-63637
AERONUTRONIC DIV PHILCO CORP NEWPORT BEACH CALIF U-3452
AD-628 245 FLD. 6/3

•N61339-1337
NAVAL TRAINING DEVICE CENTER PORT WASHINGTON N Y NAVTRADEVCEN IH-92
AD-628 949 FLD. 5/10

•N61339-1939
COMPUTER CONCEPTS INC SILVER SPRING MD
F AD-628 749 FLD. 9/2

•N62558-2905
COPENHAGEN UNIV HELSINGOER (DENMARK) MARINE BIOLOGICAL LAB
AD-628 589 FLD. 8/1
AD-628 590 FLD. 8/1
AD-628 591 FLD. 8/1
AD-628 592 FLD. 8/1

•N62558-4297
QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS
AD-628 656 FLD. 7/4

•N62558-4355
HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF MATHEMATICS
RM-17
AD-628 067 FLD. 12/2
RM-16
AD-628 172 FLD. 12/2

•N62558-4563
UNIVERSITY COLL LONDON (ENGLAND) DEPT OF PHYSICS
AD-628 234 FLD. 4/1

•NASA ORDER-R-93
NAVAL AEROSPACE MEDICAL INST PENSACOLA FLA
AD-628 291 FLD. 6/19

•NASW-2
ENRICO FERMI INST FOR NUCLEAR STUDIES UNIV OF CHICAGO ILL EFINS-61-34 (AFOSR-1133)
AD-628 255 FLD. 4/1

•NBY-32267
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CIVIL ENGINEERING R-65-32
F AD-628 063 FLD. 13/13

•NBY-53160
FRITZ ENGINEERING LAB LEHIGH UNIV BETHLEHEM PA FRITZ REPRINT-279
AD-628 209 FLD. 13/2

FRITZ REPRINT-284
AD-628 210 FLD. 13/2

•NBY-62198
AGBABIAN-JACOBSEN ASSOCIATES LOS ANGELES CALIF
AJA-6924
F AD-628 765 FLD. 20/11

•NGR-002-028
CALIFORNIA INST OF TECH PASADENA
AD-628 459 FLD. 3/2

•NGR-05-002-028
CALIFORNIA INST OF TECH PASADENA
AD-628 460 FLD. 3/2
AD-628 475 FLD. 3/2

•NGR-14-005-038
ILLINOIS UNIV URBANA COORDINATED SCIENCE LAB
REPT. NO. R-280
AD-628 114 FLD. 20/3

•NGR-40-002-015
BROWN UNIV PROVIDENCE R I
(AFOSR-65-2129)
AD-628 699 FLD. 12/2
(AFOSR-65-2128)
AD-628 700 FLD. 12/2
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
TR-65-5
(AFOSR-65-2317)
AD-628 274 FLD. 12/1

•NIH-NB-02859
LUND UNIV (SWEDEN)
(AFOSR-65-2511)
AD-628 740 FLD. 6/16

•NIH-NB-04359-02
GOTEBORG UNIV (SWEDEN) DEPT OF PHARMACOLOGY
(AFOSR-65-2854)
AD-628 741 FLD. 6/16

•NOBS-92060
UNITED STATES RUBBER CO WAYNE N J RESEARCH CENTER
F AD-628 079 FLD. 11/9

•NOBS-94092
FRITZ ENGINEERING LAB LEHIGH UNIV BETHLEHEM PA
FRITZ REPRINT-279
AD-628 209 FLD. 13/2
FRITZ REPRINT-284
AD-628 210 FLD. 13/2

•NOBSR-87535
RADIO CORP OF AMERICA HARRISON N J ELECTRONIC COMPONENTS AND DEVICES
AD-628 353 FLD. 9/1

•NOBSR-89546
LITTON INDUSTRIES SAN CARLOS CALIF ELECTRON TUBE DIV
F AD-628 231 FLD. 9/1

•NOBSR-91229
TRACOR INC AUSTIN TEX
TRACOR-66-136-U
AD-628 326 FLD. 17/1

•NOBSR-91299
GENERAL ELECTRIC CO AUBURN N Y SEMICONDUCTOR PRODUCTS DEPT
AD-628 214 FLD. 9/1

•NONR-220(47)
CALIFORNIA INST OF TECH PASADENA
AD-628 459 FLD. 3/2
AD-628 460 FLD. 3/2
AD-628 461 FLD. 20/8
AD-628 475 FLD. 3/2

•NONR-225(46)
STANFORD UNIV CALIF DEPT OF PHYSIOLOGY
AD-628 266 FLD. 6/16

•NONR-225(67)
CALIFORNIA INST OF TECH PASADENA
AD-628 876 FLD. 20/8

•NONR-225(78)
MICROWAVE LAB STANFORD UNIV CALIF
ML-1393
AD-628 076 FLD. 20/5

•NONR-228(17)
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF GEOLOGY
USC-GEOL-65-4
A AD-628 249 FLD. 8/10

•NONR-228(32)
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF PSYCHOLOGY
TR-1
AD-628 221 FLD. 5/10

•NONR-233(44)
CALIFORNIA UNIV LOS ANGELES DEPT OF PHYSICS
P-73
AD-628 077 FLD. 20/8

•NONR-233(52)
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
REPT. NO. 65-57
AD-628 169 FLD. 9/2
66-4
AD-628 220 FLD. 9/2
(AFOSR-65-2425)
AD-628 265 FLD. 12/2

•NONR-266(57)
COLUMBIA UNIV NEW YORK DEPT OF MATHEMATICS
CU-20-ONR-266(57)-M
AD-628 383 FLD. 12/1

•NONR-266(63)
COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
AD-628 645 FLD. 6/1

•NONR-266(84)
HUDSON LABS COLUMBIA UNIV DOBBS FERRY N Y
CU-146-65-ONR-266-PHYS
AD-628 781 FLD. 17/1

•NONR-266(86)
COLUMBIA UNIV NEW YORK DEPT OF CIVIL ENGINEERING AND ENGINEERING MECHANICS
TR-38
AD-628 054 FLD. 20/11

•NONR-266(89)
COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
AD-628 987 FLD. 6/15

•NONR-285(48)
COURANT INST OF MATHEMATICAL SCIENCES NEW YORK UNIV N Y
EL-8
AD-628 647 FLD. 20/6

•NONR-285(57)
NEW YORK UNIV N Y GEOPHYSICAL SCIENCES LAB
TR-66-2
AD-628 782 FLD. 14/2

•NONR-285(60)
NEW YORK UNIV N Y DEPT OF PHYSICS
AD-628 550 FLD. 7/4

•NONR-404(10)
RUTGERS - THE STATE UNIV NEW BRUNSWICK N J
F AD-628 232 FLD. 5/10

•NONR-477(38)
WASHINGTON UNIV SEATTLE LAB OF STATISTICAL RESEARCH
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| 628 624 | 5/10 |
| 628 625 | 12/2 |
| 628 626 | 12/1 |
| 628 627 | 5/3 |
| 628 628 | 20/9 |
| 628 629 | 20/9 |
| 628 630 | 20/9 |
| 628 631 | 9/1 |
| 628 632 | 20/12 |
| 628 633 | 17/9 |
| 628 634 | 20/12 |
| 628 635 | 9/1 |
| 628 636 | 20/10 |
| 628 637 | 20/9 |
| 628 638 | 5/10 |
| 628 639 | 5/10 |
| 628 640 | 5/10 |
| 628 641 | 5/10 |
| 628 642 | 7/9 |
| 628 643 | 20/2 |
| 628 644 | 8/7 |
| 628 645 | 6/1 |
| 628 646 | 11/6 |
| 628 647 | 20/6 |
| 628 648 | 11/6 |
| 628 649 | 11/6 |
| 628 650 | 20/8 |
| 628 651 | 5/10 |
| 628 652 | 7/3 |
| 628 653 | 20/11 |
| 628 654 | 12/1 |
| 628 655 | 12/1 |
| 628 656 | 7/9 |
| 628 657 | 20/6 |
| 628 658 | 7/9 |
| 628 659 | 7/3 |
| 628 660 | 7/9 |
| 628 661 | 12/1 |
| 628 662 | 20/9 |
| 628 663 | 12/1 |
| 628 664 | 13/8 |
| 628 665 | 12/1 |
| 628 666 | 6/13 |
| 628 667 | 15/7 |
| 628 668 | 11/9 |
| 628 669 | 1/1 |
| 628 670 | 9/5 |
| 628 671 | 20/1 |
| 628 672 | 17/2+1 |
| 628 673 | 21/9 |
| 628 674 | 6/19 |
| 628 675 | 11/9 |
| 628 676 | 20/9 |
| 628 677 | 9/5 |
| 628 678 | 6/17 |
| 628 679 | 6/17 |
| 628 680 | 6/17 |
| 628 681 | 11/9 |
| 628 682 | 9/1 |
| 628 683 | 20/9 |
| 628 684 | 9/9 |
| 628 685 | 20/9 |
| 628 686 | 20/9 |
| 628 687 | 6/3 |
| 628 688 | 6/3 |
| 628 689 | 6/13 |
| 628 690 | 5/10 |
| 628 691 | 9/1 |
| 628 692 | 13/2 |
| 628 693 | 17/2 |
| 628 694 | 20/9 |
| 628 695 | 8/7 |
| 628 696 | 12/2 |
| 628 697 | 12/1 |
| 628 698 | 20/8 |
| 628 699 | 12/2 |
| 628 700 | 12/2 |
| 628 701 | 5/9 |
| 628 702 | 20/11 |
| 628 703 | 12/1 |
| 628 704 | 12/2 |
| 628 705 | 20/5 |
| 628 706 | 6/9 |
| 628 707 | 6/9 |
| 628 708 | 6/9 |
| 628 709 | 6/9 |
| 628 710 | 6/9 |
| 628 711 | 9/9 |
| 628 712 | 9/1 |
| 628 713 | 6/19 |
| 628 714 | 12/1 |
| 628 715 | 20/11 |
| 628 716 | 20/11 |
| 628 717 | 5/10 |
| 628 718 | 11/11 |
| 628 719 | 12/2 |
| 628 720 | 7/9 |
| 628 721 | 12/1 |
| 628 722 | 7/9 |
| 628 723 | 6/5 |
| 628 724 | 7/5 |
| 628 725 | 9/9 |
| 628 726 | 15/6 |
| 628 727 | 6/3 |
| 628 728 | 20/12 |
| 628 729 | 20/9 |
| 628 730 | 9/2 |
| 628 731 | 15/7 |
| 628 732 | 9/1 |
| 628 733 | 7/3 |
| 628 734 | 8/13 |
| 628 735 | 6/5 |
| 628 736 | 20/11 |
| 628 737 | 20/19 |
| 628 738 | 20/11 |
| 628 739 | 20/10 |
| 628 740 | 6/16 |
| 628 741 | 6/16 |
| 628 742 | 20/12 |
| 628 743 | 6/3 |
| 628 744 | 7/5 |
| 628 745 | 20/6 |
| 628 746 | 7/9 |
| 628 747 | 5/1 |
| 628 748 | 9/1 |
| 628 749 | 9/2 |
| 628 750 | 7/9 |
| 628 751 | 6/5 |
| 628 752 | 6/5 |
| 628 753 | 5/9 |
| 628 754 | 5/9 |
| 628 755 | 6/5 |
| 628 756 | 6/5 |
| 628 757 | 6/5 |
| 628 758 | 8/10 |
| 628 759 | 20/6 |
| 628 760 | 12/1 |
| 628 761 | 3/2 |
| 628 762 | 20/9 |
| 628 763 | 6/5 |
| 628 764 | 15/7 |
| 628 765 | 20/11 |
| 628 766 | 9/2 |
| 628 767 | 9/1 |
| 628 768 | 9/2 |
| 628 769 | 9/5 |
| 628 770 | 20/12 |
| 628 771 | 20/19 |
| 628 772 | 20/19 |

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| 628 773 | 20/14 |
| 628 774 | 13/10 |
| 628 775 | 21/5 |
| 628 776 | 9/2 |
| 628 777 | 20/9 |
| 628 778 | 20/14 |
| 628 779 | 7/4 |
| 628 780 | 9/2 |
| 628 781 | 17/1 |
| 628 782 | 14/2 |
| 628 783 | 13/12 |
| 628 784 | 17/8 |
| 628 785 | 5/3 |
| 628 786 | 8/14 |
| 628 787 | 8/14 |
| 628 788 | 20/4 |
| 628 789 | 4/2 |
| 628 790 | 20/11 |
| 628 791 | 6/18 |
| 628 792 | 3/1 |
| 628 793 | 20/12 |
| 628 794 | 11/6 |
| 628 795 | 20/9 |
| 628 796 | 20/11 |
| 628 797 | 8/5 |
| 628 798 | 8/7 |
| 628 799 | 4/1 |

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|---|---|
| 628 800 | 3/1 |
| 628 801 | 3/3 |
| 628 802 | 22/2 |
| 628 803 | 8/13 |
| 628 804 | 6/16 |
| 628 805 | 6/3 |
| 628 806 | 13/13 |
| 628 807 | 9/5 |
| 628 808 | 9/4 |
| 628 809 | 20/14 |
| 628 810 | 11/2 |
| 628 811 | 20/4 |
| 628 812 | 20/8 |
| 628 813 | 3/2 |
| 628 814 | 3/2 |
| 628 815 | 5/10 |
| 628 816 | 20/14 |
| 628 817 | 4/1 |
| 628 818 | 7/4 |
| 628 819 | 9/2 |
| 628 820 | 4/2 |
| 628 821 | 6/1 |
| 628 822 | 20/12 |
| 628 823 | 6/19 |
| 628 824 | 20/8 |
| 628 825 | 20/8 |
| 628 826 | 7/2 |
| 628 827 | 9/2 |

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| 628 828 | 3/2 |
| 628 829 | 8/11 |
| 628 830 | 7/4 |
| 628 831 | 13/10 |
| 628 832 | 3/2 |
| 628 833 | 9/5 |
| 628 834 | 20/10 |
| 628 835 | 7/4 |
| 628 836 | 14/4 |
| 628 837 | 13/2 |
| 628 838 | 11/8 |
| 628 839 | 15/5 |
| 628 840 | 8/6 |
| 628 841 | 8/6 |
| 628 842 | 8/6 |
| 628 843 | 8/6 |
| 628 844 | 8/6 |
| 628 845 | 8/6 |
| 628 846 | 8/8 |
| 628 847 | 8/6 |
| 628 848 | 6/6 |
| 628 849 | 20/2 |
| 628 850 | 5/10 |
| 628 851 | 5/10 |
| 628 852 | 5/10 |
| 628 853 | 5/10 |
| 628 854 | 13/10 |
| 628 855 | 20/11 |

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| 628 856 | 20/11 |
| 628 857 | 6/5 |
| 628 858 | 9/5 |
| 628 859 | 9/5 |
| 628 860 | 8/7 |
| 628 861 | 20/6 |
| 628 862 | 7/4 |
| 628 863 | 9/2 |
| 628 864 | 5/1 |
| 628 865 | 11/6 |
| 628 866 | 8/10 |
| 628 867 | 13/13 |
| 628 868 | 8/10 |
| 628 869 | 5/9 |
| 628 870 | 20/12 |
| 628 871 | 20/14 |
| 628 872 | 20/8 |
| 628 873 | 6/4 |
| 628 874 | 4/1 |
| 628 875 | 1/1 |
| 628 876 | 20/8 |
| 628 877 | 13/8 |
| 628 878 | 20/8 |
| 628 879 | 20/8 |
| 628 880 | 20/8 |
| 628 881 | 20/8 |
| 628 882 | 20/8 |
| 628 883 | 8/11 |

# OTHER RESEARCH REPORTS AND RELATED MATERIAL

## 1. AERONAUTICS

**AD-430 087** **Field 1B**
**CFSTI Prices: HC$5.00**
ARINC Research Corp., Washington, D. C.
**ANALYSIS OF SAFETY ASPECTS OF AIRCRAFT LANDING OPERATIONS.**
Final rept.,
by E. R. Jervis, J. R. Garafola, H. Dagen and F. B. Brady. Sep 63, 160p Rept. no. 238-01-03-392
Contract FAA/ARDS-573,
Proj. FAA-114-4-3D

Descriptors: (*Aircraft landings, Aviation safety), (*Aviation safety, Aircraft landings), Analysis, All weather aviation, Pilots, Instrument landings.

Equipment and operator failures were correlated with landing-operation safety in civil aircraft. To accomplish this objective, the various equipments used in present instrument landing systems in jet aircraft of two major airlines and ground equipments of five airports were analyzed for an estimate of their reliability and safety. From this estimate, figures of merit were determined for the various components of the systems; the figures of merit indicate the contribution to failure of the components or subsystems under various conditions, such as complete redundancy or single-series operation. They determine the effect of redundant elements on overall system reliability as well as on overall failure frequency. The estimates were also compared with similar estimates obtained on recently tested equipments that reflect the latest state of the art in highly reliable electronic equipments. On the basis of these comparisons, it is expected that if reliability requirements are included in the procurement specifications, the MTBF of landing equipments can be improved by a factor of at least 10 to 1 and as much as 60 to 1. (Author)

**AD-462 332** **Field 1A, 1C**
**CFSTI Price: HC$9.60**
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
**EQUILIBRIUM, ADIABATIC WALL, AND STAGNATION TEMPERATURES AT ALTITUDES UP TO 100,000 FEET AND MACH NUMBERS UP TO 20.**
Technical memo.,
by R. P. Suess and L. B. Weckesser. Dec 64, 100p TG-603 Rev.
Contract NOw-62-0604-c

Descriptors: (*Hypersonic planes, Surface temperatures), (*Flat plate models, Surface temperatures), Stagantion point, Aerodynamic characteristics, Turbulence.

In the preliminary design phase of high velocity vehicles, quick, conservative estimates of surface temperatures are always desirable. To fill this need, the equilibrium, adiabatic wall, and stagnation temperatures have been determined for altitudes from sea level to 100,000 feet and for Mach numbers from 2 to 20. Data for both laminar and turbulent flow are presented. For easy reading, the results are presented as temperature versus Mach number plots at altitude intervals of 10,000 feet. The only information necessary to obtain equilibrium temperatures from this report is: distance from the leading edge to the point in question, emissivity of the surface, Mach number, and altitude. (Author)

**N65-35827** **Field 1A, 14B**
**CFSTI Prices: HC$3.00 MF$0.50**
Lockheed-California Co., Burbank.
**A FLIGHT AND WIND TUNNEL INVESTIGATION OF THE EFFECT OF ANGLE-OF-ATTACK RATE ON MAXIMUM LIFT COEFFICIENT,**
by Fox Conner, Craig Willey and William Twomey. Oct 65, 55p
Contract NAS4-471
NASA CR-321

Descriptors: (*Angle of attack, Lift).

**N65-35840** **Field 1A**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**EXPERIMENTAL PROFILES OF VELOCITY COMPONENTS AND RADIAL PRESSURE DISTRIBUTIONS IN A VORTEX CONTAINED IN A SHORT CYLINDRICAL CHAMBER,**
by Joseph M. Savino and Edward G. Keshock. Oct 65, 34p NASA-TN-D-3072

Descriptors: (*Vortices, Aerodynamic characteristics).

**N65-35952** **Field 1C**
**CFSTI Prices: HC$3.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**A STUDY OF THE DYNAMICS OF AIRPLANE BRAKING SYSTEMS AS AFFECTED BY TIRE ELASTICITY AND BRAKE RESPONSE,**
by Sidney A. Batterson. Oct 65, 56p NASA-TN-D-3081

Descriptors: (*Brakes, Operation), (*Aircraft, Brakes).

**N65-35958** **Field 1A**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**SUPERSONIC FLUTTER OF A THERMALLY STRESSED FLAT PANEL WITH UNIFORM EDGE LOADS,**
by Harry G. Schaeffer and Walter L. Heard, Jr. Oct 65, 26p NASA-TN-D-3077

Descriptors: (*Flutter, Panels (Structural)).

**N66-10413** **Field 1B**
**CFSTI Prices: HC$3.00 MF$1.75**
National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
**DICTIONARY OF TECHNICAL TERMS FOR AEROSPACE.**
1st edition,
by William H. Allen. 1965, 314p NASA-SP-7

Descriptors: (*Dictionaries, Aeronautics), (*Aeronautics, Dictionaries).

Identifiers: Aerospace terminology.

**N66-12151** **Field 1C, 14B**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**LOW-SPEED FORCE AND FLIGHT INVESTIGATION OF VARIOUS METHODS FOR CONTROLLING PARAWINGS.**
Technical note,
by Joseph L. Johnson, Jr. Dec 65, 49p NASA-TN-D-2998

Descriptors: (*Parawings, Control systems), (*Model tests, Parawings).

**N66-12153** **Field 1C**
**CFSTI Prices: HC$3.00 MF$0.75**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**EFFECTS OF WING PLANFORM ON THE AERODYNAMIC CHARACTERISTICS OF A WING-BODY -TAIL MODEL AT MACH NUMBERS FROM 1.70 TO 4.63.**
Technical note,
by Lloyd S. Jernell. Dec 65, 63p NASA-TN-D-3105

Descriptors: (*Wing-body configurations, Aerodynamic characteristics), (*Wings, Dihedral angle).

**N66-12531** **Field 1C, 20K**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**LOCAL PLASTIC STRESSES IN SHEET ALUMINUM-ALLOY SPECIMENS WITH STRESS-CONCENTRATION FACTOR OF 2 UNDER CONSTANT-AMPLITUDE LOADING.**
Technical note,
by John H. Crews, Jr. Dec 65, 22p NASA-TN-D-3152

Descriptors: (*Parawings, Loading (Mechanics)), (*Aluminum alloys, Stresses).

**N66-13017** **Field 1C**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**FLIGHT INVESTIGATION OF THE AERODYNAMIC PROPERTIES OF AN OGEE WING.**
Technical note,
by L. Stewart Rolls, David G. Koenig, and Fred J. Drinkwater, III. Dec 65, 21p NASA-TN-D-3071

Descriptors: (*Varying sweep wings, Aerodynamic characteristics), (*Flight testing, Varying sweep wings).

**N66-13235** **Field 1E**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**RESPONSE OF A TURBOJET AND A PISTON-ENGINE TRANSPORT AIRPLANE TO RUNWAY ROUGHNESS.**
Technical note,
by Garland J. Morris. Dec 65, 32p NASA-TN-D-3161

Descriptors: (*Runways, Roughness), (*Transport planes, Runways).

**Patent 3,221,549** **Field 1D**
**AIRCRAFT INSTRUMENT.**
Patent assigned to NASA,
by Joseph W. Wetmore. 7 Dec 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Flight instruments, Supersonic flight), (*Supersonic flight, Flight instruments), (*Vertical indicators, Supersonic flight), Flight speed indicators, Angle of attack, Attitude indicators, Take-off, Patents.

Identifiers: Sensors (Instrumentation).

The single indicator instrument enables the pilot of an aircraft to control his aircraft in the vertical plane throughout the takeoff roll, rotation to the life-off angle of attack and climbout. It is designed for use with supersonic aircraft. The system includes the use of pressure sensors.

**PB-169 155** **Field 1E**
**CFSTI Prices: HC$2.00 MF$0.50**
Bergen Research Engineering Corp., Teterboro, N. J.

**DEVELOPMENT OF A LOW COST SECONDARY AIRPORT LIGHTING SYSTEM.**
Final rept.,
by R. G. Ross. Sep 65, 28p
Contract FA-WA-4615,
Proj. FA-421-16D
SRDS RD-65-26

Descriptors: (*Airports, Lighting equipment), (*Landing lights, Airports), Costs, Night flight, Night landings, Design, Anemometers.

Low capital cost of a lighting system for VFR night operations at secondary airfields can be achieved using a three-fold design approach. This design approach employs pulsed incandescent lamps in place of xenon flash tubes, and substitutes fluorescent lights for steady burning incandescent sources when feasible. In addition, it sizes wind indicators to the legibility needs of typical secondary airport operations. The major components of the lighting system described in the report include runway edge lights, steady burning approach and threshold lights, wind tee, rotating beacon, glide slope indicator, and obstruction lights. A field test of the prototype is recommended to evaluate the operational usefulness of the low cost lighting. Also recommended, is the initiation of a new wind indicator design, based on the minimum resolution of wind speed and direction needed for secondary airport operations. (Author)

**PB-169 193** **Field 1B**
**CFSTI Prices: HC$3.00 MF$0.75**
Travelers Research Center, Inc., Hartford, Conn.
**SUMMARY OF SHORT-PERIOD TERMINAL WEATHER INFORMATION STUDIES.**
Final rept.,
by Keith D. Hage, Herbert D. Entrekin andJames W. Wilson. Oct 65, 67p
Contract FA-65-WA-1192,
Proj. FAA-150-535-02A
SRDS RD-65-120

Descriptors: (*All-weather aviation, Terminal flight facilities), (*Terminal flight facilities, Weather forecasting), (*Weather forecasting, Terminal flight facilities), Weather communications, Data processing systems, Programming (Computers), Fog, Cloud cover, Visibility.

Computer programs for converting data from punched paper tape to magnetic tape, and for decoding, error-checking, and summarizing the digital weather observations of the Federal Aviation Agency Mesonetwork surrounding Atlantic City, N. J. were developed and tested. The objectives and scope of these programs are described and sample outputs are illustrated. Twenty-five summer-season data samples from 5 to 8 mesonetwork stations were processed. Brief summaries are given of the results of additional investigations carried out under the present project and previously described in other reports. These investigations were studies of space and time variations in transmission along runways at John F. Kennedy International Airport, case studies of fog and low cloud in the Washington, D. C. Mesonetwork, and studies of radar forecasts of visual range in snow.

## 3. ASTRONOMY AND ASTROPHYSICS

**N65-35792** **Field 3B**
**CFSTI Prices: HC$2.50 MF$1.00**
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**EQUILIBRIUM THERMODYNAMIC PROPERTIES OF THREE ENGINEERING MODELS OF THE MARTIAN ATMOSPHERE,**
by Harry E. Bailey. 1965, 164p NASA-SP-3021

Descriptors: (*Thermodynamics, Planetary atmospheres).

**N65-35836** **Field 3A**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**AN APPROXIMATE SOLUTION FOR LUMINOSITY DISTANCE IN ZERO-PRESSURE RELATIVISTIC MODEL UNIVERSES THAT HAVE THE U-PROPERTY,**
by Windsor L. Sherman. Oct 65, 14p NASA-TN-D-3047

Descriptors: (*Astronomy, Models (Simulation)).

**N66-11251** **Field 3B**
**CFSTI Prices: HC$6.00 MF$1.50**
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
**PHYSICS OF THE MOON. SELECTED TOPICS CONCERNING LUNAR EXPLORATION.**
Technical note,
ed. by George C. Bucher and Henry E. Stern. Nov 65, 277p NASA-TN-D-2944

Descriptors: (*Moon, Exploration), (*Astrophysics, Moon).

## 4. ATMOSPHERIC SCIENCES

**AD-417 124** **Field 4B**
**CFSTI Price: HC$7.25**
Massachusetts Inst. of Tech., Cambridge. Dept. of Meteorology.
**STUDIES OF THE ATMOSPHERIC GENERAL CIRCULATION, IV.**
Final rept. on Planetary Circulations Project, 1 Jul 59-31 Mar 63.
30 Apr 63, 425p
Contracts AF19 (604)-6108, AF19 (604)-4958,
Proj. AF-8628,
Task 862802
AFCRL 63-628,
N63 19554

Descriptors: (*Atmospheric motion, Meteorological parameters), Geophysics, Energy, Momentum, Scientific research.

The aim of the studies reported in this publication was to elucidate the various mechanisms by which the budgets of energy, angular momentum and mass for the stratospheric region are satisfied. In this work use was made of the data gathered during the International Geophysical Year. Similar studies for the atmospheric regions from the surface up to 100mb were reported previously and it was found that large scale quasi-horizontal eddy processes proved to be the principal agents in the transfer of angular momentum, in the generation of mean zonal kinetic energy and in the transfer of heat energy. It appears that the processes in the stratosphere are more complicated. (Author)

**N65-25012** **Field 4A**
**CFSTI Prices: HC$2.00 MF$0.50**
GCA Corp., Bedford, Mass.
**ERROR ANALYSIS ON INVERSION TECHNIQUES.**
Interim Scientific rept. no. 1 for 23 May 63-30 Nov 64,
by Jean I. F. King. Nov 64, 46p GCA-TR-64-16-N
Contract NAS5 3352
NASA CR-62933

Descriptors: (*Thermal radiation, Measurement).

**PB-169 210** **Field 4B**
**CFSTI Prices: HC$1.00 MF$0.50**
National Hurricane Research Lab., Washington, D. C.
**A SIMPLE MODEL OF THE HURRICANE INFLOW LAYER.**
Technical note,
by Banner I. Miller. Nov 65, 21p WBTN-18-NHRL-75

Descriptors: (*Tropical cyclones, Mathematical models), Marine meteorology, Air mass analysis, Fluid mechanics, Atmospheric motion, Hurricane tracking.

Identifiers: Hurricane Donna (1960).

A simple numerical model of the hurricane inflow layer has been constructed. A pressure profile representative of an actual hurricane was specified. The effects of turbulent mixing (both vertical and horizontal) and of vertical advection on the field of motion were examined. It was found that the use of an eddy viscosity proportional to the pressure gradient force and a surface drag coefficient as a function of the surface wind speed results were compared with observations obtained in hurricane Donna (1960). The similarity between calculations and observations was satisfactory. (Author)

**PB-169 238** **Field 4B, 22B, 20F**
**CFSTI Prices: HC$2.00 MF$0.50**
Pennsylvania State Univ., University Park. Dept. of Meteorology.
**SYNOPTIC APPLICATIONS OF INFRARED SATELLITE DATA.**
Interim rept., 1 Jan-31 Oct 65,
by Robert Bradford, Clifford Frasch, Chin-hua Huang, Mae D. Lethbridge and Hans A. Panofsky.
31 Oct 65, 36p
Grant Cwb-WBG-48

Descriptors: (*Weather forecasting, Meteorological satellites), (*Meteorological satellites, Weather forecasting), (*Infrared radiation, Weather forecasting), Satellites (Artificial), Infrared scanning, Marine meteorology, Infrared phenomena, Meteorological parameters, Correlation techniques.

On the basis of 5 periods in April-May 1962, it is shown that DV, a quantity derived from surface ocean temperature and window radiation, is a fair indicator of vertical velocity and vorticity advection over the Atlantic, north of altitude 35 degrees. The correlation is worse over the Pacific, probably due to poor vertical velocity observations there. Cross spectrum analysis indicates that the correlation is mostly produced by wave lengths of order 40 degrees longitude, and the three fields are essentially in phase, but 90 degrees out-of-phase with the height field. Precipitation probability is strongly related to DV, as shown by study in the U. S. for March-April 1962. In particular, the probability of precipitation exceeding .04 inches in the 12 hours following an orbit varies from 2% for low DV to 66% for high DV. Water-vapor radiation (6-6.5 microns) appears to contain some additional information, the statistical significance of which needs further examination. Further, window radiation alone appears to be at least as good an indicator as DV. Water-vapor radiation has a strong diurnal variation, with largest amounts of vapor in the upper troposphere indicated in the daytime. (Author)

**PB-169 246** **Field 4B**
**CFSTI Prices: HC$2.00 MF$0.50**
Weather Bureau, Washington, D. C.
**ON THE PROBABILITY FORECASTING OF THE OCCURRENCE OF PRECIPITATION.**
Central Region note,
by Lawrence A. Hughes. Nov 65, 40p WBTN-20-CR-3

Descriptors: (*Weather forecasting, Atmospheric precipitation), (*Atmospheric precipitation, Weather forecasting), (*Probability, Weather forecasting), Climatology, Meteorology.

Problems in forecasting the point probability of the occurrence of measurable precipitation are discussed and results of such an experiment at the Weather Bureau Forecast Center, Chicago, are given based on 2 1/2 yr. of data. Discussed are de-

finitions, verification graphs, and the Brier score without and with climatology considered. The latter score makes allowance for variations in climatic frequency but does not compensate for all effects of climatic variations, especially climatic variation in areal coverage. Two methods of computation of the Brier score with climatology included are discussed. One gives a score which is relatively laborious to compute but which gives a very clear relationship of skill to the distance of the forecast probability from the climatological frequency. In the Chicago result, the reliability was high with an average deviation of only 2.1 percent in the first 12-hr. forecast period and 4.8 percent in the fourth period. The resolution was moderate in the first period and dropped rapidly thereafter. Skill dropped almost to 0 for periods beyond about 36 hr. from forecast time. Seasonal variations were minor but were underplayed by the forecasters. When the probability numbers were compared with probability words prepared concurrently, a wide range of probability numbers was found in each of the four main word categories selected, suggesting, that the meaning of the words is not constant among forecasters. In the 'no rain' category the number of forecasts had high reliability, thus showing information not communicated by the forecaster. Probability numbers are thus better than probability words. (Author)

**PB-169 247** **Field 4B, 1B**
**CFSTI Prices: HC$1.00 MF$0.50**
Weather Bureau, Washington, D. C. Weather Analysis and Prediction Div.
**FORECASTING THE FREEZING LEVEL OBJECTIVELY AS AN AID IN FORECASTING THE LEVEL OF ICING.**
Notes to Forecasters,
by Jack B. Cox. Dec 65, 20p WBTN-23-FCST-4

Descriptors: (*All-weather aviation, Weather forecasting), (*Weather forecasting, All-weather aviation), Clouds, Ice, Freezing, Nomographs.

Aviation Forecasters very often determine the base of icing in clouds for their conventional short range forecasts by extrapolating from an analysis of their area's upper air soundings. This technique is inadequate for forecasts of 24 to 36 hours. A new approach has been developed to enable A and FD to produce forecasts of the base of icing in clouds in as short a time as possible. This approach involves the relation of freezing level vs. 1000 to 500 mb. thickness values, since A and FD routinely produces 24 to 30 hour 1000 to 500 mb. thickness progs. (Author)

**PB-169 248** **Field 4B**
**CFSTI Prices: HC$3.00 MF$0.75**
National Hurricane Research Lab., Washington, D. C.
**A SUMMARY OF EMPIRICAL STUDIES OF THE HORIZONTAL MOTION OF SMALL RADAR PRECIPITATION ECHOES IN HURRICANE DONNA AND OTHER TROPICAL STORMS.**
Technical note,
by H. V. Senn and J. A. Stevens. Nov 65, 63p WBTN-17-NHRL-74

Descriptors: (*Hurricane tracking, Radar echo areas), (*Radar tracking, Tropical cyclones), (*Tropical cyclones, Radar echo areas), Marine meteorology, Storms, Atmospheric motion, Radar scanning, Meteorological radar.

Identifiers: Hurricane Donna (1960).

Echo vectors relative to the storm center, obtained by vectorially subtracting storm center motion, are analyzed for 3805 traced echoes from hurricane Donna radar film. Distributions of crossing angle and radial and tangential echo motion components are presented for various storm speeds, quadrants, and ranges from the storm center. Detailed studies show that significant differences in echo motion exist between the echoes which are observed over land and over water, and also between those observed during the nighttime and daytime periods. The dependence of echo speed on crossing angle was obtained. When the dependence of echo motion on height was studied using height as a function of range from radar, results were inconclusive. However, comparisons of echo and wind kinematics produced significant relationships which varied from quadrant to quadrant. It is also found that outward moving echoes have higher speeds than inward moving echoes in the front quadrants (the opposite being the case in the rear quadrants); that echo speeds increase with increasing storm speed; and that the absolute crossing angles of the echoes decrease with increasing storm speed. Echo lifetime studies showed that the longest lived echoes are found in the left quadrants; the mean lifetime was found to be 35 minutes, and echo lifetime is related to echo diameter. (Author)

## 5. BEHAVIORAL AND SOCIAL SCIENCES

**AD-466 126** **Field 5I**
**CFSTI Prices: HC$2.00 MF$0.50**
Air Proving Ground Center, Eglin AFB, Fla.
**PERFORMANCE EVALUATION OF APPRENTICE AIRCRAFT ELECTRONIC NAVIGATION EQUIPMENT REPAIRMEN (GENERAL) (GRADUATES OF ATC COURSE NO. ABR30131),**
by Donald I. McSheehy. Jun 65, 37p APGC-TR-65-39

Descriptors: (*Air force training, Maintenance personnel), (*Maintenance personnel, Performance (Human)), Electronic equipment, Radio navigation, Military requirements, Oscilloscopes, Voltmeters, Test equipment (Electronics), Visual inspection, Standards, Job analysis, Transistors, Circuits.

This evaluation was conducted to determine the ability of personnel trained in the ATC Airborne Electronic Navigation Equipment Repairman Course (ABR30131)to perform the duties of their specialty. Data were obtained from a 12-week performance evaluation of 19 apprentices assigned to operational units at Shaw, Charleston, and Little Rock Air Force Bases. Apprentices were found to have a good background knowledge of electronics and the principles employed in representative equipment, and to be capable of developing 5-skill maintenance proficiency with six to nine months job experience. Training on solid-state circuits is inadequate for job requirements. Other desirable changes in training include higher proficiencies for use of the dual-trace oscilloscope and vacuum tube voltmeter and familiarization with a wider variety of test equipment, also greater emphasis on block diagram analysis for line troubleshooting and on visual inspections for shop trouble analysis. As the course now meets the JTS proficiency requirements for all of these items except knowledge of transistorized equipment, revision of the Job Training Standard to justify additional training is recommended. It is also recommended that the additional training on transistorized circuits scheduled for June 1965 implementation be supplemented by training on completely transistorized equipment. (Author)

**AD-467 002** **Field 5J, 6R**
**CFSTI Prices: HC$2.00 MF$0.50**
Institute for Behavioral Research, Silver Spring, Md.
**STUDIES OF LOW DOSE RADIATION UPON COMPLEX BEHAVIOR PATTERNS.**
Annual progress rept., 1 Jun 64-30 Jun 65,
by Jack D. Findley. 30 Jun 65, 32p
Contract DA-49-193-MD-2607

Descriptors: (*Radiation effects, Behavior), (*Behavior, Radiation effects), Radiological dosage, Primates, Sensory perception, Performance tests, Attention, Sensation (Physiology), Motor reactions, Body weight, Psychophysiology, Emotions, Reaction (Psychology), Learning, X rays.

Presented in some detail are the rationale, general methods, and initial results of a research program for the study of low dose radiation upon complex behavior. Behavioral repertoires compounded from elementary units are established in primates and then assessed during a series of fractioned doses of X-radiation. Specific behavioral techniques are based upon avoidance of remote electric shock and point the way to refined and sensitive baselines for the study of radiation. A preliminary study indicates that transitory effects upon complex 'matching to sample' and total food intake may be obtained with single doses of X-ray on the order of 40 R. (Author)

**AD-467 983** **Field 5I, 5J**
**CFSTI Prices: HC$2.00 MF$0.50**
Naval School of Aviation Medicine, Pensacola, Fla.
**VALIDITY OF PERSONALITY INVENTORIES IN THE NAVAL AVIATION SELECTION PROGRAM.**
Research rept.,
by Robert B. Voas, John T. Bair, andRoaslie K. Ambler. 15 Nov 57, 40p
NM 16-01-11-1-13

Descriptors: (*Personality, Psychometrics), (*Naval personnel, Selection), (*Aviation personnel, Selection), Flight, Stress (Psychology), Naval training, Adjustment (Psychology), Fear, Anxiety, Students.

Identifiers: Personnel screening tests.

The study related a number of standard personality tests to two types of problems arising in flight training: (1) maladjustment of some cadets to military life, and (2) the development of disabling fear reactions to flying. Various scales from the MMPI demonstrated low but significant correlation with the military adjustment criterion. The findings regarding the fear reaction criterion indicate that certain standard anxiety scales are of no predictive value but are primarily useful as indicators of the concurrent status of the individual. Therefore, they could be useful in identifying individuals for early elimination or for special counseling. (Author)

**AD-468 190** **Field 5J, 5I**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval School of Aviation Medicine, Pensacola, Fla.
**COMPREHENSION BY READING VERSUS HEARING.**
Research rept.,
by Wilse B. Webb and Edward J. Wallon. 19 Jan 56, 15p
NM 001-108-100-11

Descriptors: (*Learning, Psychometrics), (*Reading, Learning), (*Hearing, Learning), Analysis of variance, Achievement tests.

Using college-level subjects, story-form information of approximately 2500 words was acquired as effectively by one reading as one hearing of the passage. Study of the material by reading for a period comparable to that required to hear such passages yielded significantly more information to the subject. (Author)

**N65-36764** **Field 5J**
**CFSTI Prices: HC$6.00 MF$1.25**
Stanford Research Inst., Menlo Park, Calif.
**EXPERIMENTS IN TACTUAL PERCEPTION,**
by James C. Bliss and Hewitt D. Crane. Nov 65, 194p
Contracts NAS2-1679, AF33 (615)-1099
NASA CR-322

Descriptors: (*Touch, Experimental data).

**PB-169 173** **Field 5J**
**CFSTI Prices: HC$5.00 MF$1.00**
Army Medical Research Lab., Fort Knox, Ky.
**SYMPOSIUM ON CUTANEOUS SENSITIVITY, 11-13 FEBRUARY 1960.**
Rept. on studies of complex behavioral processes and psychophysiological studies,
by Glenn R. Hawkes. 22 Dec 60, 173p Rept. no. 424
Proj. USAMRL-6X95-25-001,
Task 05
AD 249 541

Descriptors: (*Touch, Communication systems), (*Skin, Sensitivity), Bionics, Psychophysiology, Symposia, Sensory perception, Histology.

The purpose of the symposium conceivably is divisible into two main parts: (1) an assessment of progress toward answering some of the basic theoretical questions regarding cutaneous sensory phenomena and mechanisms, and (2) the requirements of an efficient cutaneous communication system.

**PB-169 205** **Field 5I**
**CFSTI Prices: HC$1.00 MF$0.50**
Psychological Services, Inc., Los Angeles, Calif.
**THE TROUBLE LOCATOR: A TROUBLE-SHOOTING AIR FOR A COMPLEX ELECTRONIC SYSTEM.**
Technical memo.,
by Neil D. Warren, Donald H. Schuster, and Robert S. French. Nov 57, 8p
Contract AF41 (657)-44,
Proj. AF-7709,
Task 37301
ML TM-57-22
See also PB-135 569.

Descriptors: (*Maintenance personnel, Training devices), (*Training devices, Maintenance personnel), Electronic equipment, Electronic technicians, Bombing, Navigation.

Identifiers: Troubleshooting.

The feasibility was investigated at a flight-line troubleshooting aid that would assist an Air Force line mechanic in his job, that would permit shorter training periods and use less experienced personnel without sacrificing operational maintenance, and that would permit a period of time on the job during a mechanic's first enlistment. The feasibility of such an aid was sought for the K Bombing-Navigational System. The troubleshooting device was considered possible. The concept of the device is recommended for other complex systems to alleviate the maintenance personnel shortage.

**PB-169 211** **Field 5B**
**CFSTI Prices: HC$6.00 MF$1.50**
Princeton Univ., N. J. Statistical Techniques Research Group.
**A TAGGING SYSTEM FOR JOURNAL ARTICLES AND OTHER CITABLE ITEMS: A STATUS REPORT.**
Annual rept.,
by John W. Tukey. 1963, 296p
Grant NSF-GN-297

Descriptors: (*Periodicals, Automation), (*Documentation, Automation), Indexes, Computers, Bibliographies.

Identifiers: Citation index.

Techniques for recording bibliographic items were investigated in connection with a study on statistics and probability; of particular interest were citations to other recorded material and methods for their identification. Tagging procedures were developed for recording the following items in a periodical article, a book, a thesis, or technical report: author, title, the identification of a source item, and identification of the items cited in the source item. Computers were used for recording the information.

**PB-169 241** **Field 5G**
**CFSTI Prices: HC$1.00 MF$0.50**
Milan Univ. (Italy).
**SUGGESTIONS FOR MECHANICAL TRANSLATION,**
by Silvio Ceccato and Enrico Maretti. 1957, 10p
NSF Scientific Document Project. Prepared for presentation at the Symposium of Information Theory held at London (England), Sep 55.

Descriptors: (*Machine translation, Scientific research), (*Language, Analysis), Dictionaries, Grammars, Italy.

In our opinion, linguists and engineers who have so far turned their attention to mechanical translation have been delayed by the lack of a workable description of the operations which men perform on translating. That description still seems elusive. We believe the philosophical tradition is against it; and lay people as well as scientists and linguists conform to that tradition whenever interpreting and describing human activities relevant to thought, language and knowledge. For this reason we believe that the research going on in the Italian Operational School will be of some use in this connexion. This research is carried on mainly with the view to constructing an apparatus which performs some of our mental operations and gives them verbal expression. This programme requires that the philosophical tradition be reconsidered and that we adopt some new views and results. (Author) (From 'Information Theory,' edited by Colin Cherry, p171-180)

**PB-169 253** **Field 5C**
**CFSTI Prices: HC$1.00 MF$0.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**BULGARIA.**
5th ed, Year 1965-1966.
Sep 65, 9p
Pub as International Customs Journal Bull-74.

Descriptors: (*Bulgaria, Commerce), (*Commerce, Bulgaria), Economics.

**PB-169 254** **Field 5C**
**CFSTI Prices: HC$1.00 MF$0.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**U.S.S.R.**
4th ed, Year 1961-1962.
Mar 62, 12p
Pub as International Customs Journal Bull-23.

Descriptors: (*USSR, Commerce), (*Commerce, USSR), Economics.

**PB-169 255** **Field 5C**
**CFSTI Prices: HC$6.00 MF$1.25**
International Customs Tariffs Bureau, Brussels (Belgium).
**SOUTH AFRICA (REPUBLIC OF).**
13th ed, Year 1965-1966.
Aug 65, 222p
Pub. as International Customs Journal Bull-42.

Descriptors: (*Union of South Africa, Commerce), (*Commerce, Union of South Africa), Economics.

**PB-169 256** **Field 5C**
**CFSTI Prices: HC$3.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**INDIA.**
20th ed, Year 1964-1965.
Mar 65, 77p
Pub. as International Customs Journal Bull-4.

Descriptors: (*India, Commerce), (*Commerce, India), Economics.

Identifiers: Tariffs

**PB-169 257** **Field 5C**
**CFSTI Prices: HC$4.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**MALI (REPUBLIC OF).**
1st ed, Year 1964-1965.
Oct 64, 127p
Pub. as International Customs Journal Bull-173.

Descriptors: (*Subsaharan Africa, Commerce), (*Commerce, Subsaharan Africa), Economics.

Identifiers: Mali, Tariffs.

**PB-169 258** **Field 5C**
**CFSTI Prices: HC$4.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**GUINEA (Republic of).**
1st ed, Year 1964-1965.
Oct 64, 126p
Pub. as International Customs Journal Bull-171.

Descriptors: (*Subsaharan Africa, Commerce), (*Commerce, Subsaharan Africa), Economics.

Identifiers: Guinea, Tariffs.

**PB-169 259** **Field 5C**
**CFSTI Prices: HC$6.00 MF$1.25**
International Customs Tariffs Bureau, Brussels (Belgium)
**IRISH REPUBLIC.**
7th ed, Year 1964-1965.
Jul 64, 223p
Pub as International Customs Journal Bull-190.

Descriptors: (*Eire, Commerce), (*Commerce, Eire), Economics.

**PB-169 260** **Field 5C**
**CFSTI Prices: HC$6.00 MF$1.25**
International Customs Tariffs Bureau, Brussels (Belgium).
**AUSTRIA.**
5th ed, Year 1965-1966.
May 65, 259p
Pub. as International Customs Journal Bull-191.

Descriptors: (*Austria, Commerce), (*Commerce, Austria), Economics.

Identifiers: Tariffs.

**PB-169 261** **Field 5C**
**CFSTI Prices: HC$6.00 MF$1.25**
International Customs Tariffs Bureau, Brussels (Belgium).
**PERU.**
9th ed., Year 1964-1965.
Mar 65, 220p
Availability: Published in Pub. as International Customs Journal Bull-136. Copies to DDC users only.

Descriptors: (*Peru, Commerce), (*Commerce, Peru), Economics.

**PB-169 262** **Field 5C**
**CFSTI Prices: HC$7.00 MF$1.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**GERMANY (FEDERAL REPUBLIC OF).**
10th ed, Year 1965-1966.
Sep 65, 321p
Pub. as International Customs Journal Bull-25.

Descriptors: (*Commerce, West Germany), (*West Germany, Commerce), Economics.

Identifiers: Tariffs.

**PB-169 263** **Field 5C**
**CFSTI Prices: HC$4.00 MF$1.00**
International Customs Tariffs Bureau, Brussels (Belgium).
**KINGDOM OF BURUNDI.**
1st ed, Year 1965-1966.
Jun 65, 144p
Pub. as International Customs Journal Bull-47.

Descriptors: (*Subsaharan Africa, Commerce), (*Commerce, Subsaharan Africa), Economics.

Identifiers: Tariffs, Burundi.

**PB-169 264** **Field 5C**
**CFSTI Prices: HC$2.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**MALAYSIA.**
1st ed, Year 1964-1965.
Feb 65, 42p
Pub. as International Customs Journal Bull-12.

Descriptors: (*Malaya, Commerce), (*Commerce, Malaya), Economics.

Identifiers: Malaysia, Tariffs.

**PB-169 265** **Field 5C**
**CFSTI Prices: HC$6.00 MF$1.25**
International Customs Tariffs Bureau, Brussels (Belgium).
**SWITZERLAND.**
10th ed, Year 1965-1966.
Dec 65, 225p
Pub. as International Customs Journal Bull-1.

Descriptors: (*Switzerland, Commerce), (*Commerce, Switzerland), Economics.

Identifiers: Tariffs.

**PB-169 266** **Field 5C**
**CFSTI Prices: HC$4.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**DENMARK.**
9th ed, Year 1965-1966.
Nov 65, 128p
Pub. as International Customs Journal Bull-33.

Descriptors: (*Denmark, Commerce), (*Commerce, Denmark), Economics.

Identifiers: Tariffs.

**PB-169 267** **Field 5C**
**CFSTI Prices: HC$6.00 MF$1.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**NORWAY.**
16th ed, Year 1964-1965.
Sep 64, 271p
Pub. as International Customs Journal Bull-94.

Descriptors: (*Norway, Commerce), (*Commerce, Norway), Economics.

Identifiers: Tariffs.

**PB-169 268** **Field 5C**
**CFSTI Prices: HC$4.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**ICELAND.**
5th ed, Year 1963-1964.
Mar 64, 115p
Pub. as International Customs Journal Bull-111.

Descriptors: (*Iceland, Commerce), (*Commerce, Iceland), Economics.

Identifiers: Tariffs.

**PB-169 269** **Field 5C**
**CFSTI Prices: HC$6.00 MF$1.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**FINLAND.**
11th ed, Year 1963-1964.
Oct 63, 295p
Pub. as International Customs Journal Bull-95.

Descriptors: (*Finland, Commerce), (*Commerce, Finland), Economics.

**PB-169 270** **Field 5C**
**CFSTI Prices: HC$2.00 MF$0.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**CEYLON.**
10th ed, Year 1964-1965.
Dec 64, 42p
Pub. as International Customs Journal Bull-69.

Descriptors: (*Ceylon, Commerce), (*Commerce, Ceylon), Economics.

Identifiers: Tariffs.

**PB-169 271** **Field 5C**
**CFSTI Prices: HC$2.00 MF$0.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**EAST AFRICA (COMMON CUSTOMS AND EXCISE SERVICE).**
1st ed, Year 1964-1965.
Mar 65, 31p
Pub. as International Customs Journal Bull-65.

Descriptors: (*Kenya, Commerce), (*Tanganyika, Commerce), (*Commerce, Subsaharan Africa), (*Subsaharan Africa, Commerce), Economics.

Identifiers: Uganda, Tariffs.

**PB-169 272** **Field 5C**
**CFSTI Prices: HC$5.00 MF$1.00**
International Customs Tariffs Bureau, Brussels (Belgium).
**COLOMBIA.**
9th ed, Year 1965-1966.
Oct 65, 123p
Pub. as International Customs Journal Bull-90.

Descriptors: (*Colombia, Commerce), (*Commerce, Colombia), Economics.

Identifiers: Tariffs.

**PB-169 273** **Field 5C**
**CFSTI Prices: HC$3.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**REPUBLIC OF ZAMBIA.**
1st ed, Year 1964-1965.
Mar 65, 61p
Pub. as International Customs Journal Bull-78.

Descriptors: (*Subsaharan Africa, Commerce), (*Commerce, Subsaharan Africa), Economics.

Identifiers: Tariffs, Zambia.

**PB-169 274** **Field 5C**
**CFSTI Prices: HC$5.00 MF$1.00**
International Customs Tariffs Bureau, Brussels (Belgium).
**CANADA.**
10th ed, Year 1964-1965.
Nov 64, 164p
Pub. as International Customs Journal Bull-57.

Descriptors: (*Canada, Commerce), (*Commerce, Canada), Economics.

Identifiers: Tariffs.

**PB-169 275** **Field 5C**
**CFSTI Prices: HC$4.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**RWANDA (REPUBLIC OF).**
1st ed, Year 1964-1965.
Feb 65, 124p
Pub. as International Customs Journal Bull-37.

Descriptors: (*Subsaharan Africa, Commerce), (*Commerce, Subsaharan Africa), Economics.

Identifiers: Rwanda, Tariffs.

**PB-169 276** **Field 5C**
**CFSTI Prices: HC$6.00 MF$1.25**
International Customs Tariffs Bureau, Brussels (Belgium).
**SWEDEN.**
13th ed, Year 1963-1964.
Mar 64, 215p
Pub. as International Customs Journal Bull-93.

Descriptors: (*Sweden, Commerce), (*Commerce, Sweden), Economics.

Identifiers: Tariffs.

**PB-169 277** **Field 5C**
**CFSTI Prices: HC$4.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**JORDAN (HASHEMITE KINGDOM OF JORDAN).**
2nd ed, Year 1964-1965.
Dec 64, 113p
Pub. as International Customs Journal Bull-77.

Descriptors: (*Jordan, Commerce), (*Commerce, Jordan), Economics.

Identifiers: Tariffs.

**PB-169 278** **Field 5C**
**CFSTI Prices: HC$4.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**CZECHOSLOVAKIA.**
3rd ed, Year 1955-1956.
May 55, 116p
Pub. as International Customs Journal Bull-189.

Descriptors: (*Czechoslovakia, Commerce), (*Commerce, Czechoslovakia), Economics.

Identifiers: Tariffs.

**PB-169 279** **Field 5C**
**CFSTI Prices: HC$2.00 MF$0.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**MAURITIUS.**
9th ed, Year 1955-1956.
Dec 55, 46p
Pub. as International Customs Journal Bull-71.

Descriptors: (*Indian Ocean islands, Commerce), (*Commerce, Indian Ocean islands), Economics.

Identifiers: Tariffs, Mauritius.

**PB-169 280** **Field 5C**
**CFSTI Prices: HC$4.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**TUNISIA.**
6th ed., Year 1961-1962.
Oct 61, 112p
Pub. as International Customs Journal Bull-89.

Descriptors: (*Tunisia, Commerce), (*Commerce, Tunisia), Economics.

Identifiers: Tariffs.

**PB-169 281** **Field 5C**
**CFSTI Prices: HC$7.00 MF$1.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**ITALY.**
10th ed, Year 1962-1963.
Sep 62, 366p
Pub. as International Customs Journal Bull-7.

Descriptors: (*Italy, Commerce), (*Commerce, Italy), Economics.

Identifiers: Tariffs.

**PB-169 282** **Field 5C**
**CFSTI Prices: HC$1.00 MF$0.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**GHANA.**
1st ed, Year 1957-1958.
Mar 58, 18p
Pub. as International Customs Journal Bull-104.

Descriptors: (*Ghana, Commerce), (*Commerce, Ghana), Economics.

Identifiers: Tariffs.

**PB-169 283** **Field 5C**
**CFSTI Prices: HC$6.00 MF$1.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**GREECE.**
7th ed, Year 1961-1962.
Dec 61, 284p
Pub. as International Customs Journal Bull-20.
Includes 1st supplement to no. 20, 7th ed.

Descriptors: (*Greece, Commerce), (*Commerce, Greece), Economics.

Identifiers: Tariffs.

**PB-169 284** **Field 5C**
**CFSTI Prices: HC$6.00 MF$1.25**
International Customs Tariffs Bureau, Brussels (Belgium).
**COMMONWEALTH OF AUSTRALIA.**
8th ed, Year 1963-1964.
Sep 63, 217p
Pub. as International Customs Journal Bull-166.

Descriptors: (*Australia, Commerce), (*Commerce, Australia), Economics.

Identifiers: Tariffs.

**PB-169 285** **Field 5C**
**CFSTI Prices: HC$3.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**MOROCCO (KINGDOM OF).**
7th ed, Year 1962-1963.
Oct 62, 92p
Pub. as International Customs Journal Bull-132.

Descriptors: (*Morocco, Commerce), (*Commerce, Morocco), Economics.

Identifiers: Tariffs.

**PB-169 286** **Field 5C**
**CFSTI Prices: HC$1.00 MF$0.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**REPUBLIC OF LIBERIA.**
6th ed, Year 1956-1957.
Sep 56, 19p
Pub. as International Customs Journal Bull-162.

Descriptors: (*Subsaharan Africa, Commerce), (*Commerce, Subsaharan Africa), Economics.

Identifiers: Liberia, Tariffs.

**PB-169 287** **Field 5C**
**CFSTI Prices: HC$6.00 MF$1.25**
International Customs Tariffs Bureau, Brussels (Belgium).
**GREAT BRITAIN AND NORTHERN IRELAND (UNITED KINGDOM OF).**
23rd ed, Year 1964-1965.
Jun 64, 232p
Pub. as International Customs Journal Bull-2.

Descriptors: (*Great Britain, Commerce), (*Commerce, Great Britain), (*Atlantic Ocean islands, Commerce), Economics.

Identifiers: Tariffs, Northern Ireland.

**PB-169 288** **Field 5C**
**CFSTI Prices: HC$1.00 MF$0.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**ISLE OF MAN.**
3rd ed, Year 1955-1956.
Apr 55, 7p
Pub. as International Customs Journal Bull-177.

Descriptors: (*Atlantic Ocean islands, Commerce), (*Commerce, Atlantic Ocean islands), Economics.

Identifiers: Tariffs, Man Isle.

**PB-169 289** **Field 5C**
**CFSTI Prices: HC$4.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**UNITED ARAB REPUBLIC.**
1st ed, Year 1964-1965.
Dec 64, 121p
Pub. as International Customs Journal Bull-36.

Descriptors: (*Middle East, Commerce), (*Commerce, Middle East), Economics.

Identifiers: Tariffs, United Arab Republic.

**PB-169 290** **Field 5C**
**CFSTI Prices: HC$3.00 MF$0.75**
International Customs Tariffs Bureau, Brussels (Belgium).
**UNITED KINGDOM OF LIBYA.**
2nd ed, Year 1963-1964.
Oct 63, 98p
Pub. as International Customs Journal Bull-51.
Also includes 1st supplement to no. 51, 2nd ed.

Descriptors: (*Libya, Commerce), (*Commerce, Libya), Economics.

Identifiers: Tariffs.

**PB-169 291** **Field 5C**
**CFSTI Prices: HC$1.00 MF$0.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**REUNION ISLAND.**
5th ed, Year 1958-1959.
Apr 58, 17p
Pub. as International Customs Journal Bull-46.

Descriptors: (*Pacific Ocean islands, Commerce), (*Commerce, Pacific Ocean islands), Economics.

Identifiers: Tariffs, Reunion Island.

**PB-169 292** **Field 5C**
**CFSTI Prices: HC$2.00 MF$0.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**MALTA.**
6th ed, Year 1963-1964.
Feb 64, 30p
Pub. as International Customs Journal Bull-53.

Descriptors: (*Mediterranean Sea islands, Commerce), (*Commerce, Mediterranean sea islands), Economics.

Identifiers: Malta, Tariffs.

**PB-169 293** **Field 5C**
**CFSTI Prices: HC$7.00 MF$1.50**
International Customs Tariffs Bureau, Brussels (Belgium).
**UNITED STATES OF AMERICA.**
11th ed, Year 1963-1964.
Jan 64, 303p
Pub. as International Customs Journal Bull-21.

Descriptors: (*United States, Commerce), (*Commerce, United States), United States Government, Economics.

Identifiers: Tariffs.

**PB-169 315** **Field 5C, 21D, 8G, 8I**
**CFSTI Prices: HC$8.00 MF$2.25**
Nathan (Robert R.), Associates, Inc., Washington, D. C.
**THE POTENTIAL MARKET FOR FAR WESTERN COAL AND LIGNITE. VOLUME I.**
27 Dec 65, 488p
Contract 14-01-0001-475
Report to the United States Department of the Interior Office of Coal Research.

Descriptors: (*Coal, Economics), (*Economics, Coal), (*Economic geology, Coal), (*Natural resources, Coal), Mining engineering, Fuels, Ores (Nonmetallic), Transportation, Costs, Industrial production.

Identifiers: Lignite.

The report presents an analysis of available information on the sources of supply of Western coal and lignite, the supply of alternative sources of fuels and energy, the market for fuels and energy for such major end-uses as power, steel, and other metallurgical uses, space-heating, and cement manufacture including past consumption, analysis of trends in the overall markets for fuel and energy, technological and economic trends, and trends of changes of population and industry location.

**PB-169 316** **Field 5C, 21D, 8G, 8I**
**CFSTI Prices: HC$7.00 MF$1.75**
Nathan (Robert R.), Associates, Inc., Washington, D. C.

**THE POTENTIAL MARKET FOR FAR WESTERN COAL AND LIGNITE. VOLUME II. APPENDICES.**
27 Dec 65, 352p
Contract 14-01-0001-475
Report to the United States Department of the Interior Office of Coal Research. See also PB-169 316.

Descriptors: (*Coal, Economics), (*Economics, Coal), (*Economic geology, Coal), (*Natural resources, Coal), Mining engineering, Fuelds, Ores (Nonmetallic), Costs, Industrial production.

Identifiers: Lignite.

**PB-169 318** **Field 5B**
**CFSTI Prices: HC$1.10 MF$0.50**
Engineers Joint Council, New York.
**ACTION PLAN FOR IMPROVED DISSEMINATION OF ENGINEERING INFORMATION.**
Progress rept. no. 6, 1 Oct 62-3 Feb 64,
by L. K. Wheelock and Eugene Wall. 3 Feb 64, 9p
Grant NSF-G24836
See also PB-163 258, PB-163 758, PB-169 320.

Descriptors: (*Engineering, Vocabulary), (*Vocabulary, Engineering), Subject indexing, Data processing systems, Data storage systems, Information retrieval, Dissemination, Abstracts, Processing, Training.

Identifiers: Thesawie, Engineers Joint Council.

**PB-169 320** **Field 5B**
**CFSTI Prices: HC$1.60 MF$0.50**
Engineers Joint Council, New York.
**ACTION PLAN FOR IMPROVED DISSEMINATION OF ENGINEERING INFORMATION.**
Progress rept. no. 5,
by Eugene Wall. 1 Oct 63, 19p
Grant NSF-G24836
See also PB-163 258, PB-163 262, PB-163 758, PB-169 318.

Descriptors: (*Engineering, Vocabulary), (*Vocabulary, Engineering), Subject indexing, Data processing systems, Data storage systems, Information retrieval, Dis semination, Abstracts, Processing, Training.

Identifiers: Thesauri, Engineers Joint Council.

Work has been completed on a terminological research study (which is expected to provide the basis for a Thessaurus of Engineering Terminology) and upon training staff members of EJC society journals in abstracting and coordinate indexing techniques. As input to the terminological study, 18 engineering societies and other organizations contributed about 119,000 terms. Of these, 13,948 were duplicated exactly by two or more contributors and were selected for detailed investigation. A terminological study committee, composed of volunteer professionals, was formed and organized into ten subcommittees according to different technological interests. Twenty-seven one-week, full-time meetings of the subcommitees were held, during which 130 man-weeks of professional effort were provided by the volunteers. About 11,300 important engineering terms were treated. No differences arose among engineering disciplines which were not easily resolved--although many differences did arise. A very large 'overlap' in terminology used by the various disciplines was noted. 'Source' indexing and simultaneous publication of abstracts by eight societies and at least two commerical journals continues. Four more societies have plans for joining in this activity. The one-week training course on abstracting and indexing was repeated in March. The instructor was Mr. J. C. Costello, Jr., of Battelle Memorial Institute.

**PB-169 325** **Field 5C, 13H**
**CFSTI Prices: HC$3.60 MF$0.50**
Dpartment of Commerce, Washington, D. C. Office of State Technical Services.
**CONFERENCE ON STATE TECHNICAL SERVICES (2nd), DECEMBER 9-10, 1965, STATLER HILTON HOTEL, WASHINGTON, D. C.**
Slected Portions of the Conference Proceedings.
Dec 65, 40p

Descriptors: (*Industries, United States), (*United States, Industries), (*United States Government, Industrial research), Economics, Scientific research, Commerce, Universities, Symposia.

Identifiers: Technology, State Technical Services Act.

GENERAL REMARKS ON THE STATE TECHNICAL SERVICES ACT, by J. Herbert Holloman. The Act is regarded as a means for using man's ingenuity to develop the economy and his way of life so as to reduce his burden of work. The Act is expected to enable existing technology to be more effective in the US and to make better connection between a region's needs and the output of the universities. PRESENTATION OF THE PROPOSED RULES AND REGULATIONS, by Gordon A. Christenson: Five major points are discussed: (1) Eligibility of existing programs covering State technical services for Federal assistance; (2) duplication, i.e. the prevention of funding of a program that duplicates an existing program in a State; (3) ceiteria for approval of both the State program and the special merit program; (4) composition of advisory councils that review and report on State plans and programs; and (5) qualifications of institutions to participate in the program. DISCUSSION.

## 6. BIOLOGICAL AND MEDICAL SCIENCES

**AD-465 865** **Field 6E**
**CFSTI Prices: HC$6.00 MF$1.25**
Army Inst. of Dental Research, Walter Reed Army Medical Center, Washington, D. C.
**ANNUAL PROGRESS REPORT, 1 JULY 1964-30 JUNE 1965.**
30 Jun 65, 245p
Proj. DA-3A014501A71K

Descriptors: (*Dentistry, Medical research), Military medicine, Medical examination, Army personnel, Pathology, Mouth, Teeth, Diseases, Diagnosis, Histology, Neoplasms, Bacteria, Labeled substances, Manganese, Ascorbic acid, Test methods, Diet, Saliva, Sodium compounds.

**AD-466 159** **Field 6U**
**CFSTI Prices: HC$1.00 MF$0.50**
Columbia Univ., New York.
**FINAL REPORT,**
by William Fields Caveness. 29 Mar 65, 3p
Grants Nonr (G)-00011-63, Nonr (G)-00036-64
Continued under Contract Nonr-4728 (00).

Descriptors: (*Head, Wounds + injuries), (*Battle injuries, Head), Naval personnel, Medical examination, Neurology, Epilepsy.

A study was conducted of 407 U. S. Marine and Navy personnel from the Korean campaign who received head injuries in combat or supporting activities between 1951 and 1953. Small arms fire, mortar fragments, land mines and other missiles accounted for 214 of the injuries, blast for 52 and trauma unrelated to missiles for 141. The men were followed for the first five years by a review of the original field and hospital records in 100 per cent of the cases, questionnaires in 90.6 per cent, personal correspondence in 37.5 per cent, periodic physical examination in 25.5 per cent, additional interviews in 24.5 per cent, American Red Cross field study in 69.0 per cent and Veterans Administration records in 66.5 per cent. Attention was directed to the stabilized neurologic deficit posttraumatic epilepsy, posttraumatic syndrome and social and economic factors, as these appeared in this interval.

**AD-466 169** **Field 6P**
**CFSTI Prices: HC$2.00 MF$0.50**
Medical Research Council, London (England).
**EXPEDITION TO THE COLOMBIAN ANDES (4th).**
Final rept., 1 Nov 63-31 Oct 64,
by J. C. Waterlow and H. W. Bunje. May 65, 34p
MRC-65/369
Grant DA-ERO-91-591-4-G006,
Proj. DA-3A012501B813

Descriptors: (*Physiology, High altitude), (*Potassium, Metabolism), Mountains, Colombia, Diseases, Electrolytes (Physiology), Blood chemistry, Urine, Appetite, Inhibition, Acid-base equilibrium, Exercise, Diurnal variations.

This report discusses a study of electrolyte metabolism in relation to mountain sickness. The particular hypothesis to be tested was that the symptoms of mountain sickness might be related to potassium depletion. The reasons underlying this hypothesis have been set out in full in previous reports, and are summarized in this report. (Author)

**AD-466 292** **Field 6E**
**CFSTI Prices: HC$1.00 MF$0.50**
Jewish Hospital, St. Louis, Mo.
**TO STUDY THERAPEUTIC PROPERTIES OF BLOOD PLASMA IN THE THERAPY OF TOURNIQUET SHOCK.**
Progress rept., 1 May 64-15 Jul 65,
by Morton D. Pareira. 15 Jul 65, 24p
Contract DA-49-007-MD-799

Descriptors: (*Shock therapy, Blood plasma), (*Blood plasma, Shock therapy), Effectiveness, Aging (Physiology), Hematocrit, Blood proteins, Shock (Pathology), Gamma globulin, Parentral infusions, Chloramphenicol, Rats.

Tests of therapeutic effectiveness of infusions of different human plasma fractions in the treatment of rat tourniquet trauma revealed a striking superiority of Cohn Fraction II in protecting against mortality of the trauma. The substitution of this human plasma fraction for a portion of the rat's own plasma protein in rat plasma markedly improved the therapeutic effectiveness of the rat plasma. Studies of hematocritis and fluid loss into the traumatized hind limbs revealed that animals treated with Fraction II infusions maintained a larger circulating plasma volume (lower hematocrit) than animals infused with albumin or saline. This was thought to be due to recruitment of fluid into the circulating volume combined with a smaller loss into the hind limbs. Chloramphenicol pretreatment of saline-treated traumatized animals did not produce any improvement in survival over the appropriate control group. Although infusion of recently collected human plasma did not allow any survival when used to treat the standard trauma, gamma globulin from 'fresh' plasma protected as well as did gamma globulin from aged plasma. This finding suggests that the improved portection found with aged plasma was related to the disappearance of deleterious properties from fresh plasma not associated with the gamma globulin. (Author)

**AD-466 296** **Field 6E**
**CFSTI Prices: HC$1.00 MF$0.50**
Pittsburgh Univ., Pa. School of Medicine.
**A STUDY OF ARTIFICIAL RESPIRATION AND RESUSCITATION.**
Annual progress rept., 1 Mar 64-30 Jun 65,
by Peter Safar. 30 Jun 65, 12p
Contract DA-49-193-MD-2160

Descriptors: (*Artificial respiration, Medical research), Blood transfusions, Heart, Compressive properties, Blood circulation, Epinephrine, Bicarbonates, Sodium compounds, Blood plasma, Hemorrhage, Therapy, Oxygen, Toxicity, Lungs, Dogs.

Contents: Arterial vs. venous transfusion in cardiac arrest from exsanguination; Study of pattern of dying from exsanguinating hemorrhage in dogs; Cardiopulmonary resuscitation; Treatment of massive hemorrhage with plasma and plasma substitutes; pulmonary oxygen toxicity in dogs under controlled ventilation; Pathophysiology of agonal state; Review of comprehensive emergency care organization; Writing of textbook on respiratory therapy; Hand-operated IPPB apparatus; Evaluation of non-rebreathing valves used in resuscitation equipment; Circulatory collapse from anesthesia for diaphragmatic hernia repair.

**AD-467 008** **Field 6E, 6A**
**CFSTI Prices: HC$1.00 MF$0.50**
Chicago Univ., Ill. Dept. of Medicine.
**HUMAN SKIN LIPIDS AND THEIR RELATION TO SKIN DISEASES.**
Progress rept., 1 Jun 64-1 Jun 65,
by Allan L. Lorincz. 1 Jun 65, 15p
Contract DA-49-193-MD-2341

Descriptors: (*Integumentary diseases, Lipids), (*Lipids, Integumentary diseases), Chemical analysis, Chromatographic analysis, Ultraviolet spectroscopy, Infrared spectroscopy, Absorption spectrum, Fatty acids, Chemotherapeutic agents, Head, Skin, Pathology, Humans.

This report confirms previous investigations concerning certain fractions of the unsaponifiables from human scalp surface lipids which have been found to be active in producing irritation and follicular hyperkeratosis on the inner surface of the rabbit ear when applied in acetone-alcohol solution. On the hypothesis that the irritating effect of the lipids results from oxidation products produced in them, the effect of unsaponifiables obtained after scalps of volunteers were treated with an anti-oxidant (dl-alpha-tocopherol) was compared with unsaponifiables obtained when the scalps were not so portected. Tocopherol treatment did definitely decrease the concentration of peroxides in the lipids collected. However, no clear-cut difference in the effect on the rabbit ear could be determined; effect of both samples was small. The results of a preliminary double blind study suggest that solutions of dl-alpha-tocopherol in 95% ethanol (containing 1% acetone) may be beneficial in treating acne vulgaris.

**AD-467 125** **Field 6C, 6F**
**CFSTI Prices: HC$1.00 MF$0.50**
Minas Gerais Univ. (Brazil). Inst. of Biology.
**BASIC BIOLOGY AND TROPISTIC BEHAVIOR OF SCHISTOSOMA MANSONI CERCARIAE RELATING TO CERCARICIDAL AGENTS.**
Annual technical rept., Jul 64-Jun 65,
by Jose Pellegrino. Jun 65, 12p
Grant DA-ARO-49-092-64-G55,
Proj. DA-2N014501B71D

Descriptors: (*Schistosoma, Infections), Larvae, Skin, Penetration, Countermeasures, Chemotherapy, Diagnosis, Laboratory animals, Drugs, Enzymes, Vegetable oils, Effectiveness, In vivo analysis, In vitro analysis, Brazil.

Several compounds were studied for repellent activity. Most promising is the oil from seeds of Pterdon pubescens which gave lasting protection against infection, even when diluted to 5% soln. in DMSO or ether. Repellents DEET and Entoral were not effective. Intradermal test for diagnosis was improved and purified materials developed. Techniques were developed to permit large scale culture of snail hosts and cercariae in the laboratory. A number of proposed compounds were tested after development of routine procedures. No correlation between in vitro and in vivo activities. Methods were developed for infection of hamster thru cheek pouch for screening. Studies continue on these problems and on tropistic behavior of cercariae. (Author)

**AD-467 261** **Field 6C**
**CFSTI Prices: HC$2.00 MF$0.50**
Naval Radiological Defense Lab., San Francisco, Calif.
**ACTINOMYCIN D: BLOCKAGE OF CELL DIVISION OF SYNCHRONIZED TETRAHYMENA PYRIFORMIS,**
by D. Stuart Nachtwey and William J. Dickinson.
25 May 65, 41p USNRDL-TR-858
NAVMED MR005.08-1200-9

Descriptors: (*Ribonucleic acids, Biosynthesis), (*Cell division, Ribonucleic acids), (*Antibiotics, Cell division), (*Ciliata, Cell division), Inhibition, Dosage, Culture media.

Identifiers: Actinomycins, Tetrahymena.

Synchronized Tetrahymena pyriformis cells were exposed to the antibiotic, actinomycin D, a supposed specific inhibitor of DNA-dependent RNA synthesis, in an attempt to gain information on the role of the synthesis of such RNA in the preparations of the cell for division. The following variables were studied: concentration of the drug, time after the end of the synchronizing treatment at which exposure started, and duration of exposure. The drug at sufficiently high concentrations irreversibly blocks cell division if added early enough in the synchronized cell cycle. The higher is the concentration of drug, the later is the time in the cell cycle that the drug may be added and still block the first synchronized division. The time of addition of the drug that will lead to a block of cell division is related to the concentration of the drug by a saturation-type curve. This curve extrapolates to an asymptote of 47 minutes before cell separation. Pulse exposures to the drug also irreversibly block cell division if started before certain times prior to the first or second synchronized divisions and if started during a time when cells are forming food vacuoles. These data indicate that actinomycin D enters the cells via food vacuoles and interferes with some division-essential process that is not completed at least by 47 minutes before cell separation. (Author)

**AD-467 959** **Field 6p**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval School of Aviation Medicine, Pensacola, Fla.
**THE RELIABILITY OF SELF-DETERMINATION OF PULSE RATES.**
Research rept.,
by Robert B. Voas. 15 Mar 55, 4p
NM 001-108-108-01

Descriptors: (*Pulse rate, Determination), (*Medical examination, Reliability), Stress (Physiology), Correlation techniques.

The paper considers the reliability of a group test of pulse rate.

**AD-467 970** **Field 6S**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval School of Aviation Medicine, Pensacola, Fla.
**THE CONCEPT OF AVIATOR'S 'VERTIGO',**
by W. E. Vinacke. 8 May 46, 11p Research rept. RR-7, NSAM-408
Proj. X-148 (Av-4-3)

Descriptors: (*Vertigo, Aviation personnel), (*Aviation personnel, Vertigo), Naval personnel, Psychophysiology, Attitudes, Vocabulary, Semantics.

An analysis was made of the concept of aviator's 'vertigo' based upon personal interviews with Naval aviators. To clarify the term, factors in the environment and experience of pilots are presented which bear upon the use of the word 'vertigo.' Types of events associated with 'vertigo' are described. Suggestions are offered for clarification of the concept of 'vertigo', and lines of further research indicated. (Author)

**AD-467 971** **Field 6S**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval School of Aviation Medicine, Pensacola, Fla.
**THRESHOLD OF STIMULATION OF THE HORIZONTAL SEMI-CIRCULAR CANALS IN MAN WITH PARTICULAR REFERENCE TO THE SIGNIFICANCE OF THE FIRST DERIVATIVE OF ANGULAR ACCELERATION AS A STIMULUS,**
by Ashton Graybiel, W. A. Kerr, D. I. Hupp, S. Howard Bartley, and Bruce V. Leamer. 12 Mar 47, 24p Research rept. RR-17, NSAM-418
Proj. X-148 (Av-4-3)

Descriptors: (*Acceleration tolerance, Thresholds (Physiology)), (*Semicircular canals, Stimulation), Humans, Stress (Physiology), Illusions.

Records of responses to constant angular acceleration and to changes in angular acceleration were obtained. The indicator was the oculo-gyral illusion, and three types of responses were obtained: 'left movement', 'no movement', and 'right movement'. Fairly consistent relationships between the direction and amount of change in acceleration, as expressed in each of the three types of response were obtained. A threshold for change (mean change between four 20-second periods) in both positive and negative angular acceleration was determined to be about 0.12 degrees/sec/sec. It was also found that the reliability of response to constant acceleration decreased as the length of the period to which response referred increased beyond 20 seconds at near-threshold rates. It is possible to obtain a threshold for the effectiveness of the first derivative of acceleration, or the change in the rate of change in velocity. (Author)

**AD-467 972** **Field 6S**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval School of Aviation Medicine, Pensacola, Fla.
**PREDICTING THE SUSCEPTIBILITY OF AVIATORS TO 'VERTIGO': A PRELIMINARY STUDY,**
by W. E. Vinacke. 21 Jun 46, 23p Research rept. RR-10, NSAM-411
Proj. X-148 (Av-4-3)

Descriptors: (*Vertigo, Aviation personnel), (*Aviation personnel, Vertigo), Sensitivity, Psychophysiology, Attitudes.

The report analyzes data bearing upon the susceptibility of aviators to 'vertigo'. Material derived from interviews with 77 aviators consisted of reported experiences with 'vertigo', answers to six personal questions, and objective information about the aviators' flying experience. Each subject was rated by 3 psychologists independently for degree of 'vertigo' reported, in terms of three criteria; namely, severity of individual incidents, frequency, and personal attitude. There was sufficient agreement among the raters to permit a composite 'vertigo' rating. Criterion, or extreme, groups of men with 'much vertigo' and 'little vertigo' were thus defined, and compared with respect to the way they answered the questions, and with respect to experiential factors. (Author)

**AD-467 974** **Field 6S**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval School of Aviation Medicine, Pensacola, Fla.
**EVALUATION OF AN INSTRUMENTAL CONDITIONING PROCEDURE AS AN IN X OF AUDITORY DECREMENT IN THE WHITE RAT.**
Research rept.,
by Arthur L. Hall. 15 Mar 55, 4p
NM 001-101-105-02

Descriptors: (*Hearing, Explosion effects), (*Audiometry, Analysis), Decompression, Auditory acuity, Pathology, Conditioned reflex, Rats.

Identifiers: Evaluation.

The investigation was initiated primarily as a pilot study to evaluate the use of a conditioned response as an index of auditory damage resulting from explosive decompression.

**AD-468 151** **Field 6S**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval School of Aviation Medicine, Pensacola, Fla.
**VERTIGO AS A CAUSE OF PILOT ERROR IN JET AIRCRAFT.**
Research rept.,
by Brant Clark and Ashton Graybiel. 15 Aug 56, 23p
NM 001-110-100-44

Descriptors: (*Vertigo, Pilots), (*Pilots, Errors), Jet planes, Psychometrics, Illusions, Flight, Space perception.

Vertigo is well known to pilots of aircraft, and although extensive studies have been made of its characteristics in conventional aircraft, no data are available on its characteristics during flight in jet aircraft. It was the purpose of the study to obtain information on vertigo as experienced by jet pilots. The pilots interviewed were 137 navy and marine corps pilots who were assigned to jet aircraft at the time of the interview. Individual interviews and a check list of vertigo experiences were used. It was found that 96 per cent of the pilots had experienced vertigo in jets and that the nature of vertigo was essentially the same as found in propeller driven aircraft. The most frequent illusory experience involved confusion with regard to the attitude and motion of the aircraft. The causes and prevention of vertigo were found to be essentially the same for jets as for conventional aircraft. The jet pilots believe that certain unique aspects of jet flight may contribute to difficulties in spatial orientation. (Author)

**AD-468 195** **Field 6S**
**CFSTI Prices: HC$1.00 MF$0.50**
Nval School of Aviation Medicine, Pensacola, Fla.
**THE PERCEPTION OF VERTICAL IN THE PRESENCE OF INCREASED ACCELERATIVE FORCES.**
Research rept.,
by Richard C. Woellner. 31 Oct 57, 18p
NM 17-01-11-1-45

Descriptors: (*Illusions, Stress (Physiology)), (*Visual perception, Acceleration), Acceleration tolerance, Stress (Psychology), Gravity.

A study was made of the relationship between the vertical estimated by a person tilted to his side and that determined by a person during the oculogravic illusion. The data indicate that the estimates of vertical lie close to the gravitational vertical in a tilt chair and close to the resultant of gravity and centrifugal force on a centrifuge. There is a constant but not significant error in the estimates, toward the subject's body axis. There is considerable difference among subjects as to the variability of their estimates. The accuracy of estimates of body position is fairly low in each subject. (Author)

**EGCR-4** **Field 6R, 18I, 18L**
**CFSTI Prices: HC$1.00 MF$0.50**
Tennessee Valley Authority, Oak Ridge, Tenn.
**RADIOLOGICAL HEALTH MANUAL FOR THE EXPERIMENTAL GAS-COOLED REACTOR. RADIATION PROTECTION STANDARDS AND REGULATIONS.**
1965, 28p
Contract AT (40-1)-2742

Descriptors: (*Gas-cooled reactors, Health physics), (*Health physics, Dose rate).

**IDO-17122** **Field 6R, 18D**
**CFSTI Prices: HC$1.00 MF$0.50**
Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
**A PRACTICAL SIMULTANEOUS ALPHA-BETA COUNTER FOR APPLIED HEALTH PHYSICS,**
by K. F. Smith and J. F. Sommers. Nov 65, 15p
Contract AT (10-1)205

Descriptors: (*Health physics, Alpha counters), (*Beta particles, Health physics).

**LA-3363** **Field 6R, 18I**
**CFSTI Prices: HC$1.00 MF$0.50**
Los Alamos Scientific Lab., Univ. of California, N. Mex.
**IODINE 131 SAMPLING WITH ACTIVATED CHARCOAL AND CHARCOAL-IMPREGNATED FILTER PAPER,**
by H. J. Ettinger and J. B. Dummer, Jr. Aug 65, 16p
Contract W-7405-eng-36

Descriptors: (*Iodine, Radioactivity), (*Radiological contamination, Samplers).

**LA-3382** **Field 6R**
**CFSTI Prices: HC$1.00 MF$0.50**
Los Alamos Scientific Lab., Univ. of California, N. Mex.
**90 SR, 137 CS, AND RADIOACTIVE RARE EARTHS IN ENVIRONMENTAL RAIN AND AIR AT LOS ALAMOS, NEW MEXICO, 1963-1964,**
by Ellis R. Graham. 1 Sep 65, 16p
Contract W-7405-eng-36

Descriptors: (*Air pollution, Fission products), (*Fission products, Rainfall).

**LF-27** **Field 6M**
**CFSTI Prices: HC$1.00 MF$0.50**
Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex. Dept. of Microbiology.
**INTESTINAL SPIROCHETES AND DISEASE IN DOGS.**
Technical progress rept.,
by F. F. Pindak and W. E. Clapper. Sep 65, 17p
Contract AT (38-2)-1013

Descriptors: (*Intestines, Spirochaeta), (*Spirochaeta, Dogs).

**N65-15594** **Field 6C**
**CFSTI Price: MF$2.00**
Webb Associates, Yellow Springs, Ohio.
**BIOASTRONAUTICS DATA BOOK,**
ed. by Paul Webb. 1964, 404p
NASA SP-3006
Hardcopy available from Superintendent of Documents, GPO, Wash., D. C. 20402, $2.25.

Descriptors: (*Space biology, Data).

**N65-18566** **Field 6K, 22B**
**CFSTI Price: MF$2.00**
Ntional Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
**CONFERENCE ON NUTRITION IN SPACE AND RELATED WASTE PROBLEMS,**
by T. C. Helvey. 1964, 408p NASA-SP-70
Conf. held at Univ. of South Florida, Tampa, 27-30 Apr 64, sponsored in cooperation with NASA and NAS. Handcopy available from Superintendent of Documents, GPO, Wash., D. C., 20402, $2.75.

Descriptors: (*Closed ecological systems, Nutrition), (*Wastes (Sanitary engineering), Closed ecological systems).

**N65-20625** **Field 6A, 22A**
**CFSTI Prices: HC$3.00 MF$0.75**
California Univ., Berkeley Space Sciences Lab.
**ENZYME ACTIVITY IN TERRESTRIAL SOIL IN RELATION TO EXPLORATION OF THE MARTIAN SURFACE.**
Semiannual progress rept., 1 Jul 64-1 Feb 65,
by J. O. Falkinham, J. Skujins, and A. D. McLaren.
9 Mar 65, 65p
Grant NsG-704
NASA CR-57585

Descriptors: (*Soils, Biochemistry), (*Mars probes, Soils).

**N65-34227** **Field 6C**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**ANALYSIS OF THE EXTRATERRESTRIAL LIFE DETECTION PROBLEM,**
by Richard S. Young, Robert B. Painter and Richard D. Johnson. 1965, 36p NASA-SP-75

Descriptors: (*Space biology, Life expectancy).

**N65-36768** **Field 6S**
**CFSTI Prices: HC$4.00 MF$0.75**
Aeromedical Research Lab. (6571 st). Holloman AFB, N. Mex.
**THE EFFECT ON THE CHIMPANZEE OF RAPID DECOMPRESSION TO A NEAR VACUUM,**
by Alfred G. Koestler. Nov 65, 114p
Contract NASA T-272109
NASA CR-329

Descriptors: (*Chimpanzees, Stress (Physiology)).

**N66-10316** **Field 6S**
**CFSTI Prices: HC$1.00 MF$1.00**
National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
**AEROSPACE MEDICINE AND BIOLOGY; A CONTINUING BIBLIOGRAPHY WITH INDEXES.**
Oct 65, 128p NASA-SP-7011

Descriptors: (*Aviation medicine, Space biology), (*Space biology, Aviation medicine).

**ORNL-3849** **Field 6R, 18G**
**CFSTI Prices: HC$6.00 MF$1.25**
Oak Ridge National Lab., Tenn.
**HEALTH PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JULY 31, 1965.**
Oct 65, 263p
Contract W-7405-eng-26

Descriptors: (*Radioactive waste, Disposal), (*Health physics, Radioactive waste).

**ORNL-3883** **Field 6M, 6E**
**CFSTI Prices: HC$2.00 MF$0.50**
Oak Ridge National Lab., Tenn.
**SEMIANNUAL CONTRACT PROGRESS REPORT TO THE NATIONAL INSTITUTE OF AL-**

**LERGY AND INFECTIOUS DISEASES, MARCH 1-SEPTEMBER 15, 1965,**
by N. G. Anderson and G. B. Cline. Oct 65, 45p
Contract W-7405-eng-26

Descriptors: (*Medical research, Viruses).

**Patent 3,219,521** **Field 6F**
**METHOD FOR CONTROLLING PETROMYZON MARINUS.**
Patent assigned to Interior,
by Vernon C. Applegate and John H. Howell. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Cyclostomata, Pesticides), (*Pest control, Cyclostomata), (*Larvae, Cyclostomata), Bromine compounds, Nitrophenols, Toxicity, Lethal dosage, Fishes, Patents.

Identifiers: Bromo nitrophenols, Petromyzon marinus.

The method is for protecting food and game fish in the Great Lakes by reduction of the sea lamprey population in the lakes. The larvae are controlled by establishing a concentration of from 5 to 12 parts per million of 2-bromo-4-nitrophenol in the water over and in contact with stream bottoms containing the larvae.

**Patent 3,219,654** **Field 6F, 7C**
**UREA INCLUSION COMPOUNDS OF n-ALKYL OXIRANES.**
Patent assigned to Army,
by Bruce W. Brodman and Jack Radell. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Clatherate compounds, Synthesis (Chemistry)), (*Urea, Clatherate compounds), (*O-hetercyclic compounds, Clatherate compounds), (*Fungicides, Clatherate compounds), Alkanes, Organic oxygen compounds, Humidity, Patents.

Identifiers: Epoxides, Epoxy dodecanes, Epoxy nonanes, Epoxy octanes.

The urea inclusion compounds are mycologically useful. The compound consists of a complex of urea and n-1, 2-epoxyoctane, n-1, 2-epoxynonane, or n-1, 2-epoxydodecane. The active oxirane component is slowly released in humid air.

**TID-21581** **Field 6R**
**CFSTI Prices: HC$1.00 MF$0.50**
Institute for Cancer Research, Philadelphia.
**STUDIES OF THE EFFECTS OF ULTRAVIOLET RADIATION ON CELL.**
Annual progress rept., Jan 63-Nov 64,
by Jerome J. Freed. 21 Jan 65, 20p
Contract AT (30-1)-2356

Descriptors: (*Cell structure, Radiation effects), (*Ultraviolet radiation, Cell structure).

**TID-21611** **Field 6R**
**CFSTI Prices: HC$1.00 MF$0.50**
Institute for Cancer Research, Philadelphia.
**STUDIES OF THE EFFECTS OF ULTRAVIOLET RADIATION ON CELL STRUCTURE AND BEHAVIOR. SIX-YEAR COMPREHENSIVE REPORT, MARCH 1959 NOVEMBER 1964,**
by Jerome J. Freed. 21 Jan 65, 20p
Contract AT (30-1)-2356

Descriptors: (*Cell structure, Radiation effects), (*Ultraviolet radiation, Cell structure).

**UCRL-14351** **Field 6R, 18D**
**CFSTI Prices: HC$2.00 MF$0.50**
Lawrence Radiation Lab., Univ. of California, Livermore.
**HAZARDS CONTROL QUARTERLY REPORT NO. 21, APRIL - JUNE 1965.**
1965, 39p
Contract W-7405-eng-48

Descriptors: (*Health physics instrumentation, Design).

## 7. CHEMISTRY

**AD-466 684** **Field 7D**
**CFSTI Prices: HC$1.00 MF$0.50**
Noyes Chemical Lab., Univ. of Illinois, Urbana.
**NMR SPIN-ECHO TRAINS FOR A COUPLED TWO-SPIN SYSTEM,**
by E. J. Wells and H. S. Gutowsky. 1 Jul 65, 8p
Technical rept. TR-85
Contract Nonr-1834 (13),
Proj. NR-051-215

Descriptors: (*Nuclear magnetic resonance, Radiofrequency pulses), Nuclear spins, Modulation, Protons, Deuterated compounds, Chlorine compounds, Carboxylic acids, Bromine compounds, Thiophenes.

Identifiers: Chloroacrylic acids, Dibromo thiophenes.

The effect of pulse separation on NMR Carr-Purcell spin echo trains is considered for pulse experiments on coupled pairs of spin-1/2 nuclei in the liquid phase. Previous discussions have assumed that in the homonuclear weakly coupled AX limit the modulation of the echo amplitude envelope depends only on the magnitude of the spin coupling and is independent of the pulse separation. Theoretical and experimental results are presented which show that in both AB and AX systems the modulation decreases in frequency and effectively disappears as the rf pulse separation decreases. (Author)

**AD-467 697** **Field 7E, 8D**
**CFSTI Prices: HC$1.00 MF$0.50**
Woods Hole Oceanographic Institution, Mass.
**CESIUM 131 TRACER FOR YIELD DETERMINATION IN CESIUM RADIOCHEMISTRY.**
Technical rept.,
by Victor E. Noshkin. Jul 65, 13p Ref-65-40
Contract Nonr-2196 (00),
Proj. NR-083-004
NYO 2174-33,
NYO 3145-5

Descriptors: (*Cesium, Radiochemistry), (*Radiochemistry, Cesium), (*Tracer studies, Ecology), (*Ecology, Tracer studies), Radioactive isotopes, Synthesis (Chemistry), Geochemistry.

Cesium 131 is shown to be the most suitable isotope for use as tracer in chemical yield determinations in the low-level radiochemistry of cesium 137 in samples from the environment. The conditions for cyclotron preparation of Cs131 of very high radiochemical purity are described as are the preparation and use of a generator for the repeated separation of Cs131 from its parent Ba 131. Counting precautions are outlined, to be followed when Cs 131 is used before beta or gamma determination of Cs 137. (Author)

**AD-467 754** **Field 7D, 9A, 20E, 3B**
**CFSTI Prices: HC$3.00 MF$0.75**
Columbia Radiation Lab., New York.
**RESEARCH INVESTIGATION DIRECTED TOWARD EXTENDING THE USEFUL RANGE OF THE ELECTROMAGNETIC SPECTRUM.**
Quarterly progress rept. no. 2 (Progress rept. no. 10), 16 Mar-15 Jun 65,
by R. Novick. 15 Jun 65, 77p CU-6-65-AMC-00099 (E)
Contracts DA-28-043-AMC-00099 (E), DA-36-039-sc-90789
Continuation of Contract DA-36-039-sc-90789. See also AD-678 089.

Descriptors: (*Atomic spectroscopy, Microwave equipment), (*Molecular spectroscopy, Spectrum analyzers), (*Solid state physics, Microwave spectroscopy), (*Masers, Microwave equipment), Lasers, Radio astronomy, X-ray spectroscopy, Radioactive isotopes, Relaxation time, Electron transitions, Carbon dioxide.

Successful observations were made on the spectra of 6328A light scattered from carbon dioxide near the critical temperature and critical density. A technique was developed for measuring the two relaxation times characterizing the disorientation of optically aligned atoms in a vapor. The excitation energies of the metastable autoionizing atomic states in the alkali atoms were remeasured using an electron gun with much better energy resolution. The value of the differential Stark shift in the 3P1 excited state of Hg measured by level crossing in signals in parallel electric and magnetic fields was found to be 2360 plus or minus 70 cps/ (kV/cm)-sq.

**ANL-7064** **Field 7B, 7A, 18G**
**CFSTI Prices: HC$1.00 MF$0.50**
Argonne National Lab., Ill.
**CONSOLIDATION OF LANTHANON FISSION PRODUCTS IN ALLOYS,**
by J. B. Knighton, R. A. Mancini, and R. K. Steunenberg. Aug 65, 22p
Contract W-31-109-eng-38

Descriptors: (*Fission products, Alloys).

**C13.46-275** **Field 7D, 7B, 8E, 11F,2**
**CFSTI: MF$0.75**
National Bureau of Standards, Washington, D. C. Analytical Chemistry Div.
**QUANTITATIVE SEPARATIONS: TITRIMETRY, GRAVIMETRY, FLAME PHOTOMETRY, SPECTROPHOTOMETRY, GAS EVOLUTION AND ISOTOPIC PREPARATIONS, JULY 1964 TO JUNE 1965,**
by Oscar Menis. 27 Dec 65, 88p NBS-TN-275
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.50.

Descriptors: (*Quantitative analysis, Standards), (*Volumetric analysis, Standards), (*Gravimetric analysis, Standards), (*Spectroscopy, Standards), (*Gas analysis, Standards), (*Reactor materials, Quantitative analysis), Metals, Plutonium, Uranium, Instrumentation, Separation, Iron alloys, Copper alloys, Heat-resistant alloys, Ceramic materials, Clay, Rock (Geology), Actinide series.

Identifiers: Flame photometry.

This is the first of a series of annual progress reports dealing with the activities of the Quantitative Separations Section of the Analytical Chemistry Division. The work described encompasses the following areas of competences: titrimetry, gravimetry, flame spectrophotometry, spectrophotometry, gas components in metals. It includes also areas dealing with uranium and plutonium chemistry. Its major effort during the past year was to establish the most accurate values for the chemical composition of over twenty-five standard reference materials by means of the above listed analytical disciplines. The group performed the analysis and ascertained the accuracy of the methods selected for certifying values for a given composition of the material. (Author)

**C13.46-276** **Field 7E**
**CFSTI Price: MF$1.00**
National Bureau of Standards, Washington, D. C. Inst. for Materials Research.
**RADIOCHEMICAL ANALYSIS: ACTIVATION ANALYSIS, INSTRUMENTATION, RADIATION**

**TECHNIQUES, AND RADIOISOTOPE TECHNIQUES JULY 1964 TO JUNE 1965,**
by James R. DeVoe. 7 Jan 66, 171p NBS Technical note-276
Availability: Hard copy available from Superintendents of Documents, GPO, Washington, D. C., 20402, $1.00. See also C-13.46:248, PB-168 039.

Descriptors: (*Radiochemistry, Chemical analysis), (*Chemical analysis, Radiochemistry), Instrumentation, Radioactivation analysis, Test methods, Electron accelerations, Gamma-ray spectroscopy, Nuclear radiation spectrometers, Computers, Mossbauer effect, Iron compounds, Standards, Radioactive isotopes, Tracer studies.

A Mossbauer spectrometer which uses optical interferometry in the Doppler drive, and the mechanical design for the electromechanical drive described in last years report are presented. A description of chemical shift of iron compounds is given. The use of a correction factor for certain source detector geometries are described for Mossbauer spectroscopy. A new source of Sn (119m) in palladium which produces a very narrow line width is also described. For the first time a trace element has been certified in a Standard Reference Material with the assistance of the activation analysis technique. Flux measurements for the NRL reactor are given. A number of special analyses for various NBS projects by activation analysis are described (e.g. argon in silicon, chlorine in polystyrene, hafnium in zirconium). A betagamma sum coincidence gamma ray spectrometer is described. A constant potential electrochemical method of analysis using radioisotopic tracers is presented which has potential high sensitivity. A method of using radioisotopic tracers in heterogeneous equilibrium between an aqueous medium of cobalt to be analyzed and manganese dioxide impregnated filter paper is described. Some results on the precision of the substoichiometric radioisotope dilution analysis of silver and iron are presented.

**IS-1105** **Field 7E**
**CFSTI Prices: HC$1.00 MF$0.50**
Ames Lab., Iowa State Univ. of Science and Tech.
**ANALYSIS OF A DAMASCUS STEEL BY NEUTRON AND GAMMA ACTIVATION,**
by A. F. Voigt and A. Abu-Samra. 25 Feb 65, 12p CONF-650405-1
Contract W-7405-eng-82
Prepared for Presentation at International Conference on Modern Trends in Activation Analysis, College Station, Tex.

Descriptors: (*Steel, Neutron activation), (*Neutron activation, Gamma-ray spectra).

**IS-1222** **Field 7C, 7D**
**CFSTI Prices: HC$4.00 MF$0.75**
Ames Lab., Iowa State Univ. of Science and Tech.
**CATALOG OF NUCLEAR QUADRUPOLE INTERACTIONS AND RESONANCE FREQUENCIES IN SOLIDS. PART II. HALOGEN RESONANCES IN ORGANIC COMPOUNDS,**
by S. L. Segel and R. G. Barnes. Sep 65, 109p
Contract W-7405-eng-32

Descriptors: (*Nuclear resonance, Organic compounds).

**IS-1241** **Field 7D, 9B**
**CFSTI Prices: HC$2.00 MF$0.50**
Ames Lab., Iowa State Univ. of Science and Tech.
**APPLICATION OF GIBBS-DUHEM EQUATION TO BINARY VAPOR-LIQUID EQUILIBRIUM DATA OF METAL SYSTEMS USING NEWTONS INTERPOLATION FORMULAE,**
by V. E. Sater and F. D. Stevenson. Aug 65, 38p
Contract W-7405-eng-52

Descriptors: (*Chemical equilibrium, Liquid metals), (*Programming (Computers), Numerical analysis).

**MLM-1266** **Field 7E, 18B, 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
Mound Lab., Miamisburg, Ohio.
**MOUND LABORATORY PROGRESS REPORT FOR MAY 1965,**
by J. F. Eichelberger, G. E. Grove, and L. V. Jones. 21 May 65, 32p
Contract AT (23-1)-GEN-53

Descriptors: (*Radiochemistry, Scientific research).

**N65-35833** **Field 7D, 11H**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**A MASS SPECTROMETRIC ANALYSIS OF DC 704 DIFFUSION-PUMP OIL FRAGMENTATION,**
by H. Shapiro and B. N. Paxson. Oct 65, 9p NASA-TN-D-3033

Descriptors: (*Oils, Mass spectroscopy), (*Mass spectroscopy, Oils).

**N65-35955** **Field 7D**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**PARTIAL WAVE CALCULATION OF THE DIATOMIC MOLECULE (HeH) + +,**
by Harris Rabinovich. Oct 65, 18p NASA-TN-D-3050

Descriptors: (*Wave functions, Diatomic molecules).

**N66-12252** **Field 7D, 20M**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**SUMMARY OF THERMOPHYSICAL PROPERTIES OF POTASSIUM,**
Technical note,
by Harold H. Coe. Dec 65, 37p NASA-TN-D-3120

Descriptors: (*Potassium, Thermodynamics), (*Alkali metals, High-temperature research).

**N66-12528** **Field 7D, 20B**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**DEPENDENCE OF ADSORPTION PROPERTIES ON SURFACE STRUCTURE FOR BODY-CENTERED-CUBIC SUBSTRATES.**
Technical note,
by Robert J. Bacigalupi and Harold E. Neustadter. Dec 65, 22p NASA-TN-D-3141

Descriptors: (*Adsorption, Substrates), (*Substrates, Metallic crystals).

**N66-12530** **Field 7C**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**AN EXPLORATORY STUDY OF A NEW CLASS OF STEPLADDER AND LADDER POLYMERS, POLYIMIDAZOPYRROLONES.**
Technical note,
by George F. Pezdirtz and Vernon L. Bell. Dec 65, 19p NASA-TN-D-3148

Descriptors: (*Polymers, High-temperature research), (*Thermal stability, Polymers).

**N66-13227** **Field 7D, 9A**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**OPERATING PARAMETERS OF THE OMEGATRON MASS SPECTROMETER IN ULTRAHIGH VACUUM.**
Technical note,
by James M. Bradford, Jr. Dec 65, 43p NASA-TN-D-3129

Descriptors: (*Mass spectroscopy, Spectrum analyzers), (*Electron tubes, Vacuum apparatus).

Identifiers: Omegatron mass spectrometer.

**NYO-2543-1** **Field 7D**
**CFSTI Prices: HC$6.00 MF$1.25**
Johns Hopkins Univ., Baltimore, Md.
**ATOMIC ENERGY LEVELS.**
Final rept.,
by J. A. Bearden and A. F. Burr. 1965, 249p
Contract AT (30-1)-2543

Descriptors: (*Atomic energy levels, Data).

**ORINS-48** **Field 7B**
**CFSTI Prices: HC$1.00 MF$0.50**
Oak Ridge Inst. of Nuclear Studies, Inc., Tenn.
**ELECTRODEPOSITION OF ACTINIDES AND LANTHANIDES,**
by Stephen M. Kim, John E. Noakes, and L. K. Akers. 13 Dec 65, 20p
Contract AT (40-1)-GEN-23

Descriptors: (*Rare earth elements, Electrodeposition), (*Electrodeposition, Rare earth).

**ORNL-3876** **Field 7B, 7A**
**CFSTI Prices: HC$2.00 MF$0.50**
Oak Ridge National Lab., Tenn.
**ACID LEACHING OF PRODUCTS FROM THE FLUIDIZED-BED COMBUSTION OF GRAPHITE-BASE REACTOR FUELS AND THE HF-O 2 DISINTEGRATION OF STAINLESS STEEL- AND ZIRCONIUM-CLAD OXIDE FUELS,**
by L. M. Ferris. Nov 65, 31p
Contract W-7405-eng-26

Descriptors: (*Fluidized bed processes, Reactor fuels).

**PB-169 137** **Field 7A**
**CFSTI Prices: HC$4.00 MF$0.75**
Minnesota Univ., Minneapolis. Dept. of Chemical Engineering.
**AN ANALYSIS OF CHEMICAL REACTOR STABILITY AND CONTROL,**
by Rutherford Aris and Neal R. Amundson. 1965, 110p
Grant NSF-G-2402

Descriptors: (*Industrial equipment, Control), (*Control systems, Mathematical analysis), Stability, Feasibility studies, Nonlinear systems, Phase studies, Thermodynamics, Differential equations, Integration, Servomechanisms, Reaction kinetics.

Identifiers: Reactors (Chemical).

To design rationally a chemical reactor with its associated control equipment it is necessary to study the transient behavior of the system. A well agitated continuous reactor either of the liquid or fluidized variety is considered under various types of control, and criteria are derived enabling one

to determine under what conditions various modes of control are feasible. Using the methods of nonlinear mechanics it is shown that the steady states of the system exhibit the whole range of stable and unstable critical points. A complete phase plane analysis is made by integrating the differential equations numerically on a computer. These calculations were carried out for perfect proportional control on the coolant using the reactor temperature as an indicator. Some generalizations are indicated. (Author)

**RL-SEP-244 (Del.)** **Field 7B, 7D**
**CFSTI Prices: HC$2.00 MF$0.50**
General Electric Co., Richland, Wash. Hanford Atomic Products Operation.
**CONTINUOUS ELECTROWINNING OF PLUTONIUM METAL. SCALEUP STUDIES: PROGRESS REPORT,**
by T. S. Seine. Apr 65, 41p
Contract AT (34-1)-1350

Descriptors: (*Plutonium, Electrochemistry).

**SC-RR-65-625** **Field 7B**
**CFSTI Prices: HC$1.00 MF$0.50**
Sandia Corp., Albuquerque, N. Mex.
**ABSORPTIVITIES OF COMPLEXES FROM THE VARIATION AND THE MOLE RATIO METHODS FOR COMPLEX DETERMINATIONS,**
by James O. Wear. Nov 65, 15p
Contract AT (29-1)-789

Descriptors: (*Complex compounds, Chemical analysis).

**TD-21660** **Field 7C**
**CFSTI Prices: HC$3.00 MF$0.75**
Fordham Univ., New York.
**THE THERMODYNAMICS AND KINETICS OF COORDINATION COMPOUNDS.**
Progress report,
by Michael Cefola and Philip S. Gentile. 4 Feb 65, 55p
Contract AT (30-1)-906

Descriptors: (*Complex compounds, Reaction kinetics), (*Thermodynamics, Complex compounds).

## 8. EARTH SCIENCES AND OCEANOGRAPHY

**AD-287 161** **Field 8K, 17J**
**CFSTI Price: HC$3.00**
Jersey Production Research Co., Tulsa, Okla.
**DETECTION OF DISTANT EXPLOSIONS BY SEISMIC MEASUREMENTS IN DEEP BOREHOLES.**
Final rept.,
by D. R. Van Sandt. 31 Jul 62, 94p JPRCo-JS62:49-4489
Contract AF19 (604)-8346, ARPA Order-180-61,
Projs. AF-8652, Vela-Uniform,
Task 865203
AFCRL 62-878

Descriptors: (*Seismology, Underground explosions), Explosion effects, Seismic waves, Propagation, Signal-to-noise ratio, Detection, Instrumentation.

Identifiers: Vela-Uniform.

Simultaneous measurements of seismic signals in adjacent cased and open boreholes are compared. In general, the same earth noise is recorded in both holes, and the response to a high amplitude unidirectional signal is the same in both holes. The conclusion is that the casing in a borehole has no detectable effect upon a seismic signal if the casing is cemented to the borehole wall and wall-coupled geophones are used.

**AD-467 337** **Field 8C, 20D**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval Underwater Ordnance Station, Newport, R. I.
**PRELIMINARY STUDIES ON THE TURBULENT CHARACTERISTICS OF OCEAN WAVES.**
Technical memo.,
by David H. Shonting. Jul 65, 24p TM-342
Task RU22-2E-000/219-1/R004-03-01

Descriptors: (*Ocean waves, Turbulence), Fluid dynamic properties, Seacoast, Rhode Island, Narragansett Bay, Hydrodynamics, Mathematical models.

This report presents the results of preliminary ocean wave studies made in an endeavor to learn more about the turbulent characteristics of wind waves in the open ocean. A series of hypothetical wave models presented indicate a mechanism of momentum transfer within the waves. Two series of wave motion measurements were made, one from a Navy pier in Narragansett Bay and a second from Buzzards Bay Entrance Light Station. The measurements were made to obtain rough data on particle velocity motions in various sea states and to examine their variances, covariances and respective spectral properties. These preliminary measurements indicated that relatively large amounts of wind-imparted momentum are transferred through the water column by correlations of the wave motions themselves. The values of the variances of the particle motions reflected the strong exponential attenuation with depth. The autospectra clearly displayed the fundamental frequencies of the wind waves and the low frequency swell. The strong attenuations of the wind wave turbulence with depth is contrasted with the weaker attenuation of the swell. (Author)

**AD-472 354** **Field 8K**
**CFSTI Prices: HC$3.00 MF$0.75**
Saint Louis Univ., Mo. Dept. of Geophysics and Geophysical Engineering.
**THE S WAVE PROJECT FOR FOCAL MECHANISM STUDIES EARTHQUAKES OF 1963.**
Scientific rept.,
by William Stauder and G. A. Bollinger. 31 Jul 65, 98p
Grant AF-AFOSR-62-458
AFOSR 65-2319

Descriptors: (*Earthquakes, Seismic waves), (*Seismology, Earthquakes), Brazil, Atlantic Ocean, Geophysics, Geology.

Identifiers: S-waves, Kurile Island.

This report describes the determination of the focal mechanism of the larger earthquakes of each year using methods developed for the use of S waves in focal mechanism studies. In addition to the methods of data analysis described in detail in the previous report for earthquakes of 1962, in studying the earthquakes of 1963 use has also been made of a computer program. The program uses an error surface to search for the position of the axes of a double couple which gives the least standard deviation of the S wave polarization data. Seventy-two earthquakes of magnitude $> 6$ and 1/4 occurred during 1963. Of these thirty-five earthquakes, so located as to afford a distribution of seismographic stations favorable for the use of S wave data, were selected for examination. Satisfactory focal mechanism solutions are here presented for twenty-six of these shocks. Tentative solutions are given for six, and no solution is advanced for the remaining three. Data have been more numerous for the study of the earthquakes of 1963 as compared to those of the previous year, but the general quality of the data and reliability of the solutions remains unchanged. Earthquakes in three regions are selected for special note: Kurile Island earthquakes, two deep focus earthquakes of Brazil, and three North Atlantic earthquakes. (Author)

**PB-169 138** **Field 8D, 7B, 7D, 8G**
**CFSTI Prices: HC$3.00 MF$0.50**
Princeton Univ., N. J.
**THE SOLUBILITY OF CALCITE IN AQUEOUS SOLUTIONS. I. THE SOLUBILITY OF CALCITE IN WATER BETWEEN 75 DEGREES AND 200 DEGREES at C02 PRESSURES UP TO 60 ATM.**
Final rept.,
by E. R. Segnit, H. D. Holland and C. J. Biscardi. 1965, 55p
Grant NSF-G-6069

Descriptors: (*Minerals, Deposition), (*Calcite, Solubility), (*Ores (Nonmetallic), Deposition), Solutions, Chemical equilibrium, Volumetric analysis, Thermo chemistry, Chemical precipitation, Vapor pressure.

The solubility of calcite in distilled water was measured at 75C, 100C, 125C, 150C, and 200C at C02 pressures between 2 and 60 atm. Samples of solution in equilibrium with calcite and a vapor phase were taken at the operating temperature and pressure; their calcium content was determined by means of an EDTA titration. The results agree quite well with those of Ellis and are consistently higher above 10 atm. than those of Miller. The experimentally determined solubility isotherms can be fitted adequately with curves calculated on the basis of Debye-Huckel theory, and the observed decrease of calcite solubility with increasing temperature agrees quantitatively with that expected on the basis of available thermodynamic data. The results indicate that hydrothermal solutions should tend to become undersaturated with respect to calcite on cooling. Calcite precipitation is therefore probably due to causes other than simple cooling. Loss of a vapor phase is one possible mechanism of calcite precipitation which may be of importance in certain epi- and meso-thermal deposits, but it does not seem to account for calcite precipitation in the majority of ore deposits. (Author)

**PB-169 199** **Field 8K**
**CFSTI Prices: HC$1.00 MF$0.50**
Defense Research Lab., Univ. of Texas, Austin.
**QUARTERLY STATUS REPORT NO. 3 ON CONTRACT CGS-1198, 1 MAY THROUGH 31 JULY 1964.**
7 Oct 64, 17p
Contract CGS-1198

Descriptors: (*Seismometers, Experimental design), Seismology, Instrumentation, State-of-the-art reviews.

The construction of a solion vertical seismometer and a reduced-size solion horizontal seismometer is complete. Shake table experiments have been performed on these instruments at the Geotechnical Corporation, Garland, Texas. Both instruments were used for evaluation tests at the U. S. Coast and Geodetic Survey Seismic Laboratory, Albuquerque, New Mexico. The vertical seismometer performed very well, but the horizontal unit had spurious noise. Work has been planned to isolate the source of this noise and eliminate it. Reproductions of records made at Albuquerque are included. (Author)

**RME-4545** **Field 8G**
**CFSTI Prices: HC$2.00 MF$0.50**
Division of Raw Materials (AEC), Washington, D. C.
**RECONNAISSANCE FOR URANIUM IN NORTHEAST COASTAL BRAZIL,**
by John W. Gabelman. Jan 64, 33p
Prepared in cooperation with Comissao Nacional de Energia Nuclear de Brasil, Rio de Janeiro.

Descriptors: (*Uranium, Geological survey).

# 9. ELECTRONICS AND ELECTRICAL ENGINEERING

**AD-401 050** **Field 9A, 20C**
**CFSTI Prices: HC$2.00**
Eitel-McCullough, Inc., San Carlos, Calif.
**RESEARCH ON MICROWAVE WINDOW MULTIPACTOR AND ITS INHIBITION.**
Quarterly progress rept. no. 1, 1 Jul-30 Sep 62, by Oskar Heil and Donald Preist. 1962, 42p
Contract DA-36-039-sc-90818, ARPA Order-318-62,
Task OST-76-10-318-28-03

Descriptors: (*Waveguide windows, Microwave equipment), (*Microwaves, Waveguide windows), Failure (Electronics), Electron tubes, Electron bombard ment, Heating, Electric arcs, Optical coatings, Secondary emission, Reduction.

Identifiers: Multipactor effect.

Various methods of improving the control and application of evaporation coatings to waveguide windows for multipactor reduction is discussed. Special emphasis is given to multipactor reduction using the electron accelerating forces resulting from field inhomogeneities. Two methods for instantaneous multipactor detection are given. Expected effects from a grooved window surface are discussed. (Author)

**AD-408 398** **Field 9A, 9C**
**CFSTI Price: HC$3.00**
Eitel-McCullough, Inc., San Carlos, Calif.
**RESEARCH ON MICROWAVE WINDOW MULTIPACTOR AND ITS INHIBITION.**
Quarterly progress rept. no. 2, 1 Oct-31 Dec 62, by Oskar Heil and Donald Preist. 31 Dec 62, 72p
Contract DA-36-039-SC-90818, ARPA Order-318-62,
Task DA-OST-76-10-318-28-03

Descriptors: (*Waveguide windows, Electron bombardment), (*Electron tubes, Microwave frequency), (*Electric discharges, Waveguide windows), (*Coatings, Waveguide windows), Radiofrequency power, Configuration, Secondary emission, Evaporation, Metal film, Klystrons, Magnetic fields, Theory, Processing, Dielectrics.

An Experimental Study of Electron Bombardment Phenomena at the Output RF Windows of High Power Microwave Tubes. Phase 1. Experimental and analytical study of multipactor effects at waveguide windows under high power conditions. Phase 2. Development and aplication of evaporation coatings and techniques applied to the window and surrounding metal parts in order to reduce secondary emission coefficient to less than unity. Study of the Inner-Window Surface and Configurations Affecting Power Handling Capabilities of High Power Microwave Tubes. Phase 1. Analysis of various means of obtaining space and phase defocusing of electrons by shaping the fields and window surfaces. Phase 2. Study of materials and coatings in conjunction with shaped fields to develop windows capable of handling higher powers without multipactor. (Author)

**AD-421 001** **Field 9A, 9C**
**CFSTI Price: HC$2.00**
Eitel-McCullough, Inc., San Carlos, Calif.
**RESEARCH ON MICROWAVE WINDOW MULTIPACTOR AND ITS INHIBITION.**
Quarterly progress rept. no. 4, 1 Apr-30 Jun 63, by Oskar Heil and Donald Preist. 30 Jan 63, 42p
Contract DA 36-039-SC-90818, ARPA Order-318-62,
Task DA-1G6-22001-A-055-04

Descriptors: (*Waveguide windows, Electron bombardment), (*Electron tubes, Microwave frequency), (*Electric discharges, Waveguide windows), (*Coatings, Waveguide windows), Configuration, Radiofrequency power, Klystrons, Magnetic fields, Surfaces, Silicates, Mechining, Precision finishing, Dielectrics.

Construction of a new high power test facility to incorporate a specially constructed klystron to operate on a power range between .1 and 1 megawatt to allow the use of the full tube duty cycle at 200 kilowatt peak output level. Construction of a new window box to allow the use of vacuum on both sides of the window. Grooved silica windows, uncoated were tested and the results reported. (Author)

**AD-427 895** **Field 9A, 9C**
**CFSTI Price: HC$3.00**
Eitel-McCullough, Inc., San Carlos, Calif.
**RESEARCH ON MICROWAVE WINDOW MULTIPACTOR AND ITS INHIBITION.**
Quarterly progress rept. no. 5, 1 Jul-30 Sep 63, by Raymond Hayes. 30 Sep 63, 43p
Contract DA 36-039-SC-90818, ARPA Order-318-62,
Task DA-1G6-22001-A-055-04
See also AD-421 001.

Descriptors: (*Waveguide windows, Electron bombardment), (*Electron tubes, Microwave frequency), (*Electric discharges, Waveguide windows), (*Metal coatings, Waveguide windows), Secondary emission, Radiofrequency power, Vapor plating, Titanium, Titanium compounds, Monoxides, Seals (Stoppers), Tests, Ceramic materials, Ultrahigh frequency, Resistance (Electrical), Thermal stresses, Surface properties, Aromatic materials.

Multipactor discharges at beryllia and alumina windows operating at 2700 Mc/s were suppressed by evaporated coatings of titanium with resistivities in the range 10 to the 7th power to 10 to the 10th power ohms per square. Arching at the ceramic-metal seal limited the peak power dissipated in the window test units; this occurred at about 25 MW equivalent transmitted power. Coated windows tested under high power showed no multipactor. An alumina window cracked due to thermal stresses at an equivalent transmitted power of 103 kw average and 10.3 MW peak. A coated beryllia window operated satisfactorily up to 260 kw average and 13 MW peak equivalent transmitted power without failure. (Author)

**AD-437 141** **Field 9A, 9C**
**CFSTI Price: HC$3.00**
Eitel-McCullough, Inc., San Carlos, Calif.
**RESEARCH ON MICROWAVE WINDOW MULTIPACTOR AND ITS INHIBITION.**
Quarterly progress rept. no. 6, 1 Oct-31 Dec 63, by Raymond Hayes. 31 Dec 63, 78p
Contract DA-36-039-SC-90818, ARPA Order-318-62,
Task DA-7900-21-223-15-00

Descriptors: (*Waveguide windows, Electron bombardment), (*Electron tubes, Microwave frequency), (*Electric discharges, Waveguide windows), (*Metal coatings, Waveguide windows), Secondary emission, Radiofrequency power, Dielectrics, Aluminum compounds, Beryllium compounds, Oxides, Titanium compounds, Titanium, Sputtering, Monoxides, Evaporation.

Multipactor discharges at beryllia and alumina windows have been suppressed by both sputtered titanium suboxide coatings and evaporated titanium coatings. Tentative thickness limits in terms of sputtering current and time have been established for titanium monoxide coatings sputtered in argon. A range of coatings sputtered in mercury have been satisfactory but thickness limits have not yet been determined. Evaporated titanium coatings with resistivities at deposition in the region of 1 megohm/square have been the most satisfactory to date. Lighter coatings will suppress multipactor only after a period of operation. The upper limit of thickness has not yet been found. Coatings have been tested at 2700/Mc/s up to equivalent transmitted powers of 40 Mw peak and 320 kW average without failure. Power has been limited by arcing at the metal-dielectric seal rather than by multipactor discharges. The threshold power for arcing can be increased considerably by reducing the pulse width of the test facility from 20 to 3 microseconds. Other methods of increasing the peak power are discussed, including a new window design with increased arc resistance.

**AD-457 165** **Field 9B, 14E**
**CFSTI Price: HC$2.00**
National Cash Register Co., Hawthorne, Calif., Electronics Div.
**DATA DISPLAY STUDY.**
Quarterly rept. no. 7, 21 Jun-20 Sep 64, by W. Stein. 20 Sep 64, 48p NCR-ED Technical-Pub-3619
Contract DA-36-039-sc-90855

Descriptors: (*Data transmission systems, Display systems), (*Display systems, Data transmission systems), Fiber optics, Cathode ray tubes, Digital-to-analog converters, Electronic recording systems.

The purpose of this program is to conduct a research study and an experimental investigation to determine techniques, methods of application, and design criteria for automatic conversion of digital data into display form including graphs, maps, and pictorial displays. A breadboard of the two-image plane projector to be used in the developmental model has been evaluated, and construction of the final unit has been started. Final data on the phosphor tests has been reviewed. The principal phases of system design for the exploratory developmental model have been completed.

**AD-463 913** **Field 9A**
**CFSTI Price: HC$1.00**
Army Missile Command, Redstone Arsenal, Ala. Army Inertial Guidance and Control Lab.
**AN ACTIVE LOW-PASS FILTER,**
by H. V. White. May 65, 12p Rept. no. RG-TR-65-7
Proj. DA-1X279191D678

Descriptors: (*Low-pass filters, Amplifiers), Filters (Electromagnetic wave), Analysis, Design, Microminiaturization (Electronics), Stabilized platforms.

The analysis and design of an active low-pass filter for use in inertial platform systems (though not restricted to this application) are presented in this report. The filter features minimum size and weight and increased reliability through the use of a single microcircuit, yet it maintains performance comparable to conventional types presently used for the same purpose. Little difficulty should be encountered in making the external circuitry an integral part of the operational amplifier in a finalized version of the unit.

**AD-474 019** **Field 9B, 12A**
**CFSTI Prices: HC$3.00 MF$0.50**
Massachusetts Inst. of Tech., Cambridge.
**CALCULAID: AN ON-LINE SYSTEM FOR ALGEBRAIC COMPUTATION AND ANALYSIS.**
Master's thesis,
by Mayer Elihu Wantman. Sep 65, 55p MAC-TR-20
Contract Nonr-4102 (01),
Proj. NR-048-189

Descriptors: (*Programming (Computer), Algebra), (*Algebra, Programming (Computer)), Real time, Scheduling, Digital computers.

Identifiers: Theses, Multiple access system.

OPS is an on-line system developed by M. Greenberger et. al. at Project MAC. The present work provides a powerful and simple way to perform numerical manipulations and calculations within OPS. The program package is called CALCULAID, and provides a method of executing algebraic assignment statements, of which MAD and FORTRAN assignments are a subset. When this assignment-statement ability is coupled with other features of the OPS system, most of the ability of

a compiler language is provided. Because the programs written in OPS are executed interpretively, OPS-3 programs can be changed and re-run immediately, without being recompiled. The applications of CALCULAID to the analysis of a round-robin scheduling model and to a process-control problem are discussed, and conclusions are drawn regarding the suitability of running computational programs in an interpretive mode. (Author)

**BDX-613-1** **Field 9B, 12B, 14D**
**CFSTI Prices: HC$1.00 MF$0.50**
Bendix Corp., Kansas City, Mo.
**APPLICATION OF PUNCHED CARD TECHNIQUES FOR OPTIMIZING RELIABILITY,**
by Jack H. Swafford and John J. Hoefer. Feb 59, 12p
Contract AT (29-1)-613

Descriptors: (*Reliability (Electronics), Optimization), (*Punched cards, Computers).

**LA-3298** **Field 9B, 6R**
**CFSTI Prices: HC$2.00 MF$0.50**
Los Alamos Scientific Lab., Univ. of California, N. Mex.
**COMPUTER REDUCTION OF METABOLIC DATA OBTAINED FROM SCINTILLATION COUNTERS,**
by P. N. Dean. Dec 65, 23p
Contract W-7405-eng-36

Descriptors: (*Programming (Computers), Metabolism), (*Metabolism, Scintillation counters).

**LA-3373** **Field 9B, 20H**
**CFSTI Prices: HC$4.00 MF$1.00**
Los Alamos Scientific Lab., Univ. of California, N. Mex.
**DTF-IV-A FORTRAN-IV PROGRAM FOR SOLVING THE MULTIGROUP TRANSPORT EQUATION WITH ANISOTROPIC SCATTERING,**
by K. D. Lathrop. 15 Jul 65, 141p
Contract W-7406-eng-36

Descriptors: (*Programming languages, Polynomials), (*Neutrons, Scattering).

**N65-17259** **Field 9E**
**CFSTI Prices: HC$3.00 MF$0.75**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**AN ANALYSIS OF SIMULTANEOUS BEAM FORMATION BY MEANS OF PASSIVE SCATTERING MATRICES AND UNIFORM PLANAR ANTENNA ARRAYS,**
by R. F. Schmidt. Nov 64, 68p Rept. nos. X-525-64-343; TMX-55126

Descriptors: (*Antenna radiation patterns, Antenna arrays), (*Antenna arrays, Antenna radiation patterns).

**N65-17278** **Field 9F, 17B**
**CFSTI Prices: HC$2.00 MF$0.50**
Tennessee Univ., Knoxville. Dept. of Electrical Engineering.
**DOUBLE-RECEPTION DISCRETE DATA OPTIMUM CONTINUOUS SIGNAL RECOVERY.**
Scientific rept. no. 1,
by J. C. Hung. 15 Jun 63, 31p
Grant NsG351
NASA CR-60781
Presented at International Telemetering Conference (1st), 23-27 Sep 63, London, England.

Descriptors: (*Telemeter systems, Optimization), (*Data transmission systems, Telemeter systems).

**N65-17524** **Field 9A**
**CFSTI Prices: HC$3.00 MF$0.50**
Massachusetts Inst. of Tech., Cambridge. Electronic Systems Lab.
**COMPUTER-AIDED ELECTRONIC CIRCUIT DESIGN, PART I AND CONDUCTION PROCESSES IN THIN FILMS, PART II.**
Status rept. for 1 Jan-30 Nov 64.
Dec 64, 52p Rept. no. ESL-SR-225
Grant NsG496 (Part)
NASA CR-60836

Descriptors: (*Thin films (Storage devices), Conductivity), (*Electrical networks, Computers).

**N65-35834** **Field 9B**
**CFSTI Prices: HC$3.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**DESIGN OF REAL TIME COMPUTERS UTILIZING COUNTING TECHNIQUES,**
by George J. Moshos. Oct 65, 53p NASA-TN-D-3042

Descriptors: (*Computers, Real time).

**N65-35960** **Field 9B, 8G**
**CFSTI Prices: HC$5.00 MF$1.00**
Northwestern Univ., Evanston, Ill.
**A SURFACE-FITTING PROGRAM FOR AREALLY-DISTRIBUTED DATA FROM THE EARTH SCIENCES AND REMOTE SENSING,**
by E. H. Timonthy Whitten, William C. Krumbein, Irma Waye, and Walter A. Beckman, Jr. Nov 65, 150p
Grant NGR-14-007-027
NASA ER-318

Descriptors: (*Programming (Computers), Structural geology).

**N66-10318** **Field 9A, 13H**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**SELECTIVE ELECTROPLATING OF ETCHED CIRCUITS.**
Technical memo.,
by Charles E. Whitfield, Sr. and Howard Herzig. Nov 65, 4p NASA-TM-X-1168

Descriptors: (*Printed circuits, Electroplating), (*Electroplating, Printed circuits).

**N66-10414** **Field 9C, 17B, 22B**
**CFSTI Prices: HC$1.00 MF$0.60**
Research Triangle Inst., Durham, N. C.
**MICROELECTRONICS IN SPACE RESEARCH.**
Aug 65, 130p
Contract NASr-236
NASA SP-5031

Descriptors: (*Microminiaturization (Electronics), Space communication systems), (*Space communication systems, Microminiaturization (Electronics)).

**N66-13048** **Field 9B, 14D**
**CFSTI Prices: HC$5.00 MF$1.00**
Westinghouse Electric Corp., Baltimore, Md.
**RESEARCH ON FAILURE FREE SYSTEMS.**
Final rept., Phase 2 (Contractor rept.).
Dec 65, 165p
Contract NASw-572
NASA CR-343

Descriptors: (*Electronics, Reliability (Electronics)), (*Computers, Redundant components).

**ORNL-3877** **Field 9B, 20J, 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
Oak Ridge National Lab., Tenn.
**FORTRAN PROGRAMS FOR THE CLEBSCH-GORDAN AND RACAH COEFFICIENTS AND THE NINE-J SYMBOL,**
by Taro Tamura. Nov 65, 13p
Contract W-7405-eng-26

Descriptors: (*Programming (Computers), Quantum mechanics).

**Patent 3,217,185** **Field 9A**
**RING COUNTER STABILIZING CIRCUITRY FOR CONDITIONS OF NON-CONDUCTION OF ALL STAGES OR CONDUCTION OF MORE THAN ONE.**
Patent assigned to Navy,
by Arnolds Jansons. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Circuits, Stabilization), (*Counting methods, Circuits), Patents, Rings, Fire control system components, Control systems, Semiconductor devices, Electronic switches.

Identifiers: Ring counters.

The stabilization circuit is for use with ring counters. The ring counters are utilized in airborne radar fire control systems and missile control circuitry. Three transistors and associated component circuitry are utilized in a novel arrangement to assure that one and only one stage of the associated ring counter is in an 'ON' state at all times. The condition when all stages are 'OFF' is sensed and immediately the first stage is placed in an 'ON' condition.

**Patent 3,217,186** **Field 9A**
**CONTROL APPARATUS FOR BALANCING VOLTAGE DROPS ACROSS SERIES TRANSISTORS.**
Patent assigned to Navy,
by Frank G. Logan. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Voltage regulators, Transistors), (*Transistors, Voltage regulators), Patents, Control systems, Voltage, Circuits.

The apparatus increases the reliability and useful life time of transistors especially in circuits where transistors are subjected to variable voltage drop conditions. Such circuits are used for degaussing coils and for reversible polarity D.C. amplifiers employed to drive magnetic amplifiers. Positive equalization is provided for voltage drops in series transistors. Equalization is carried out by control circuits which are electrically isolated from the transistors.

**Patent 3,217,244** **Field 9C**
**MULTIPLE CONDUCTOR CABLE TESTER HAVING ROTATABLE ANNULAR SWITCH MEANS FOR TEST- ING INSULATION RESISTANCE, CROSS WIRING AND CONTINUITY.**
Patent assigned to Army,
by George G. Glover. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Test equipment, Electric cables), Patents, Electric insulation, Resistance (Electrical), Rotary switches, Measuring devices (Electrical + electronic).

The device is for testing insulation resistance, continuity, and cross wiring of an electrical cable. The device includes a terminal jack for connecting the cable under test to an annular switching means, which in turn is removably connected by a double pole, double throw switch to either a first circuit for indication insulation resistance or to a second

circuit for indicating continuity and cross wiring. A test adapter is connected to the free end of the cable under test when the cable tester is being used to check for continuity and cross wiring.

**Patent 3,217,287** **Field 9E**
**ARRAY PHASING BY VARIABLE-SPEED MAGNETIC DRUMS.**
Patent assigned to Navy,
by Lesis A. Knox. 9 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Phase control devices, Transducers), (*Transducers, Phase control devices), Patents, Variable speed drives, Magnetic cores, Phase (Electronics), Rotation, Hydrophones, Delay circuits.

The phasing of electro-magnetic and electroacoustic transducer arrays is accomplished by varying the speed of rotation of magnetic drums. One or more drums are utilized having 'write' heads connected to the individual hydrophone elements in the array and 'read' heads whose radial distances from their associated 'write' heads increase linearly in proportion to the axial distance of the 'read' heads along the drum. The speed of the drum is variable, for example by use of a variac which controls the A.-C. input to the servo motor which rotates the drum, and the magnitude of the constant of proportionality (the delay taper) of the delay depends on the speed of the drum. Thus, the amount of delay inserted in each hydrophone channel can be varied by a simple adjustment of the speed of the magnetic drum.

**Patent 3,218,465** **Field 9A**
**BI-STABLE CIRCUIT FOR GATING AND LOGIC EMPLOYING TUNNEL DIODES.**
Patent assigned to Navy,
by John M. Hovey. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Computer logic, Tunnel diodes), Patents, Semiconductor devices, Gates (Circuits), Diodes (Semiconductor), Germanium, Counting methods.

The semiconductor binary circuit is for performing logic and gating functions. The circuit employs the rapid switching characteristics of a tunnel diode with the conducting properties of an ordinary diode and the reflecting characteristics of a delay line.

**Patent 3,218,470** **Field 9A**
**DIRECT COUPLED LOGIC CIRCUIT.**
Patent assigned to Army,
by Edward D. Padgett, Christ W. Anagnost and Arthur H. Hendrickson. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Computer logic, Patents), Switching circuits, Semiconductors devices, Coupling circuits, Reliability (Electronics).

The circuit is useful in electronic navigation computer, arming, safeing and fusing systems found in missiles, rockets, and space vehicles. Three p-n-p-n semiconductor devices are directly coupled to each other in a manner that controls and transmits electrical energy in an intelligent manner. The circuit includes two switches, a plurality of resistors, an AND gate, an arming circuit and the firing circuit of a warhead.

**Patent 3,218,479** **Field 9E**
**PHASE DETECTOR ASSEMBLY.**
Patent assigned to NASA,
by Gordon D. Anderson. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Phase detectors, Patents), Phase (Electronics), Phase measurement, Tunnel diodes, Analog-to-digital converters.

The phase detector is for comparing the phase relationship between a first input signal and a second input signal. The assembly has other uses in the general field of event detection and phase measurement and in analog to digital conversion of phase information. Tunnel diodes are used in the assembly.

**Patent 3,219,969** **Field 9A, 20A**
**ELECTROACOUSTIC TRANSDUCER AND DRIVING CIRCUIT THEREFOR.**
Patent assigned to Navy,
by Benjamin L. Snavely. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Electroacoustic transducers, Circuits), Underwater sound equipment, Patents.

The electroacoustic transducer is capable of operating under the surface of the water, between 20 and 2,000 fathoms, at high efficiencies. The circuit requires small amounts of power for controlling the movement of an oscillating armature.

**Patent 3,219,970** **Field 9A, 20A**
**UNDERWATER SOUND TRANSDUCER WITH RESONANT GAS BUBBLE.**
Patent assigned to Navy,
by Claude C. Sims. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Transducers, Very low frequency), (*Underwater sound equipment, Very low frequency), Bubbles, Patents.

The underwater transducer operates at very low frequencies with high efficiency. Sound radiating from a rigid vibrating diaphragm is coupled to the surrounding water through a bubble of gas.

**Patent 3,221,489** **Field 9B**
**ELECTRONIC DIGITAL COMPUTER ELAPSED PROCESSING TIME METER.**
Patent assigned to Navy,
by Ernest A. Mackey and William A. Counterman. 7 Dec 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Digital computers, Time-interval counters), Patents, Computer storage devices, Transistors.

The electronic digital computer elapsed-processing-time meter maintains a record of time utilized by a computer in performing computations. The time meter permits proper billing for actual computer usage. A signal received from the magnetic memory unit of the computer is utilized, together with various circuits, and a clock device to measure the time the computer is in operation.

**PB-169 139** **Field 9C, 9A**
**CFSTI Prices: HC$4.00 MF$0.75**
Stanford Univ., Calif. Stanford Electronics Labs.
**TRANSFORMERLESS n-PORT SYMMETRICAL-TRANSMISSION-LINE SYNTHESIS,**
by Charles V. Shaffer. Aug 65, 106p Technical rept. TR-6558-2, SU-SEL-65-072
Grant NSF-GP-520

Descriptors: (*Transmission lines, Synthesis), Matrix algebra, Networks, Waveguides, Waveguide filters, Resistors, Capacitors.

A practical transmission-line network must not require either ideal or conventional transformers. A particularly useful transformerless realization is a cascade of (n+1)-conductor transmission lines of commensurate length. This canonical form is synthesized from a reactance matrix or its inverse, by a matrix version of Richards' theorem. For symmetrical n-ports (all ports indistinguishable from each other) two results, applicable to both lumped and distributed networks, are given. For the important special class of physically symmetrical 3-ports, complete necessary and sufficient conditions are given for the transformerless realizability of the matrix by a cascade of 3-inner-conductor transmission lines. A short discussion of networks containing R-C transmission lines, with and without lumped resistors and capacitors, points out the lack of a 1:1 correspondence with the L-C case when coupled lines are used.

**PB-169 206** **Field 9C, 17B**
**CFSTI Prices: HC$2.00 MF$0.50**
Polytechnic Inst. of Brooklyn, N. Y. Microwave Research Inst.
**A COMPARISON OF THE THRESHOLD PERFORMANCE OF THE FREQUENCY DEMODULATOR USING FEEDBACK AND THE PHASE LOCKED LOOP.**
Research rept.,
by Donald L. Schilling and Joseph Billig. 28 Feb 64, 30p PIBMRI-1207-64
Grant NSF-GP-2059

Descriptors: (*Demodulators, Frequency modulation), (*Phase-locked systems, Frequency modulation), Theory, Feedback, Communication systems, Signal-to-noise ratio, Performance (Engineering), Modulation, Mathematical analysis.

The paper presents a simplified approach to the problem of Threshold Extension by the use of Frequency Demodulators with Feedback, and Phase Locked Loops. The response of these devices to an FM signal is obtained by extending Rices results for the FM Discriminator. Using these results the authors replace each device by their linear equivalent circuit, and add one dependent noise source (the noise depends on the input SNR). The result is an easy to analyze equivalent circuit for each device, and a simple equation describing the output SNR in terms of the input SNR and the system parameters. Experimental results are then presented which verify the theory. (Author)

**PB-169 244** **Field 9E, 17G, 22B**
**CFSTI Prices: HC$2.00 MF$0.50**
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
**DESIGN OF THE TRANSIT SATELLITE ELECTRONICS SYSTEM,**
by J. W. Hamblen and J. B. Oakes. Sep 60, 41p TG-394
Contract NOrd-7386

Descriptors: (*Navigation, satellites, Electronic equipment), (*Electronic equipment, Navigation satellites), Design, Doppler navigation, Satellite antennas, Telemeter systems.

Identifiers: Transit.

The Transit navigation system is based upon the ability to extract extremely accurate positional information from the measured doppler shift of a satellite's transmitter during a single passage of the satellite within range of a single tracking station. The effect of ionospheric refraction enters directly into the accuracy with which this information can be obtained. To investigate this effect over a broad frequency region, each experimental Transit satellite contains four transmitters operating in the frequency range between 54 and 324 megacycles. These transmitters are arranged in pairs, and each pair is driven from a single stable frequency source. This plan allows for a two frequency real time refraction correction by phase comparison methods, in addition to the four frequency refraction investigation.

**PB-169 249** **Field 9A, 17B**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aviation Facilities Experimental Center, Atlantic City, N. J.

**EVALUATION OF UHF ANTENNA COUPLERS TYPES CU-691/U AND CU-692/U.**
Final rept.,
by James G. Dong. Nov 65, 40p
Proj. 221-150-01V
SRDS RD-65-124

Descriptors: (*Antenna components, Coupling circuits), (*Coupling circuits, Antenna components), Air traffic control systems, Communication equipment, Ultrahigh frequency, Cavity resonators, Antenna feeds.

Identifiers: CU-691/U, CU-692/U.

Laboratory tests were conducted on UHF Antenna Couplers, Types CU-691/U and CU-692/U to determine their suitability for FAA use. The CU-691/U Coupler was designed for four-channel operation and the CU-692/U, two-channel operation. Both systems employed passive networks comprised of tandem coaxial cavities operating as selective filters. These filters, and a suitable matching network combination, were designed to provide the capability of connecting more than one transmitter and/or receiver to a single antenna. Measurements were made of such operating parameters as VSWR, selectivity, insertion loss, and isolation. Orbital flight patterns of the antenna radiation, when utilizing the Antenna Coupler, Type CU-691/U, were also accomplished. Based on the results of the evaluation, it was concluded that the Antenna Couplers, as designed, were suitable for FAA use. It was recommended that the use of these Antenna Couplers be considered in the planning of Remote Communication Air/Ground Systems. (Author)

**PB-169 328** **Field 9B, 20D**
**CFSTI Price: HC$147.00**
Douglas Aircraft Co., Inc., Long Beach, Calif.
**THREE DIMENSIONAL POTENTIAL FLOW. COMPUTER PROGRAM.**
Program for IBM 7090,
by R. L. 1962, 12 pieces in on set
Contract Nonr-2722 (00)
See also AD-282 255.

Descriptors: (*Programming (Computers), Fluid mechanics), (*Three dimensional flow, Programming (Computers)), (*Fluid mechanics, Programming Computers)), Digital computers, Compilers, Analytic geometry, Vector analysis, Matrix algebra, Curve fitting, Aerodynamic configurations, Hydrodynamic configurations, Flow charting, Control sequences, Magnetic tapes, Punched cards.

Identifiers: IBM 7090.

This is the IBM 7090 computer program for CALCULATION IS NON-LIFTING POTENTIAL FLOW ABOUT ARBITRARY THREE-DIMENSIONAL BODIES (AD-282 255, CFSTI $12.50). The set comprises program descriptions for: (1) Body Generating Program: Program V149 of V150 Series; (2) Input Program, Non-symmetry: Program V150 of V150 Series; (3) Control Program: Program V151 of V150 Series; (4) Matrix Formation Program, Non-symmetry: Program V152 of V150 Series; (5) Matrix Formation Program, One Plane of Symmetry: Program V153 of V150 Series; (6) Matrix Formation Program, Two or Three Planes of Symmetry: Program V154 of V150 Series; (7) Solution Program: Program V155 of V150 Series; (8) Input Program, One Plane of Symmetry: Program V156 of V150 Series; (9) Input Program, Two or Three Planes of Symmetry: Program V157 of V150 Series; (10) Final Print Program: Program V160 of V150 Series. Also included are: (11) Two Program Decks (1) One-plane Symmetry, (2) Two-plane Symmetry; (12) IBM Tape containing compatibility program for Douglas Aircraft problem - 'Three Dimensional Potential Flow.' (originally programmed for the IBM 704, this tape makes the program compatible for running on the IBM 7090.

**TID-21927** **Field 9A**
**CFSTI Prices: HC$3.00 MF$0.75**
Tennessee Univ., Knoxville. Dept. of Electrical Engineering.
**A SURVEY AND EVALUATION OF BIAS STABILIZATION TECHNIQUES IN TRANSISTOR CIRCUITS.**
Scientific rept no. 2,
by E. J. Kennedy and J. F. Pierce. 29 Jun 62, 67p
Contract W-7405-eng-26

Descriptors: (*Transistors, Circuits), (*Circuits, Stabilization).

**UCLA-12-573** **Field 9B, 6R**
**CFSTI Prices: HC$2.00 MF$0.50**
California Univ., Los Angeles. Lab. of Nuclear Medicine and Radiation Biology.
**A FORTRAN IV PROGRAM FOR THE EVALUATION OF POST-IRRADIATION SURVIVAL TIMES,**
by James L. Leitch and Nancy S. Hagen. Nov 65, 39p
Contract AT-04-1-GEN-12

Descriptors: (*Programming (Computers), Life span), (*Radiation effects, Life span).

## 10. ENERGY CONVERSION (NON-PROPULSIVE)

**N66-12128** **Field 10C**
**CFSTI Prices: HC$6.00 MF$1.25**
Monsanto Research Corp., Everett, Mass.
**DEVELOPMENT OF THE DRY TAPE BATTERY CONCEPT.**
Contractor rept.,
by Bernard A. Gruber, Joseph J. Byrne, Ralph Kafesjian, Kurt W. Klunder and Elizabeth A. McElhill.
Dec 65, 201p
Contract NAS3-4168
NASA CR-347

Descriptors: (*Batteries + components, Theory).

**Patent 3,221,547** **Field 10A**
**APPARATUS FOR ABSORBING AND MEASURING POWER.**
Ptent assigned to NASA,
by Robert Y. Wong, William J. Nusbaum and Donald E. Holeski. 7 Dec 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Turbines, Pneumatic brakes), (*Pneumatic brakes, Turbine parts), (*Power, Measurement), Torque, Torque couplings, Turbine stators, Turbine blades, Absorption, Patents.

The apparatus provides a measured power input to a rotatable shaft for ascertaining the amount of power dissipated in the bearings and seals around the shaft. The reverse turbine air brake supplies the deficiencies of conventional power absorption devices. This air brake uses a stator which imparts a tangential momentum to the braking fluid before it enters the rotor vanes in a direction opposite to the rotation of the rotor. The rotor removes this tangential momentum and thereby absorbs power. Because the stator imparts tangential momentum to the braking fluid before it contacts the rotor vanes, this apparatus is capable of absorbing torque at near zero speed.

## 11. MATERIALS

**AD-456 491** **Field 11L, 13J**
**CFSTI Price: HC$1.00**
Naval Civil Engineering Lab., Port Hueneme, Calif.
**EXPERIMENTAL WOOD PILING TREATMENTS FY-64,**
by Thorndyke Roe, Jr. and Harry Hockman. 24 Dec 64, 10p Technical note N672
Proj. Y-R005-07-01-007

Descriptors: (*Piers, Wood), (*Wood, Preservation), (*Creosote, Effectiveness), Absorption (Physical), Weight, Analysis, Determination, Data, Tables.

Twenty-foot sections cut from forty-foot Class B Douglas fir piles were treated with creosote and creosote plus additives in the NCEL wood treating plant. Retentions of preservative were determined by weight increase and by core analyses.

**AD-462 609** **Field 11F**
**CFSTI Price: HC$1.00**
Naval Ordnance Test Station, China Lake, Calif.
**EFFECTS OF ULTRASOUND ON DEFORMATION CHARACTERISTICS OF STRUCTURAL METALS, 1 JULY 1963-30 JUNE 1964. PART 4. INTERNAL FRICTION AND CRYSTAL PLASTICITY IN INTENSE ULTRASONIC FIELDS.**
Technical progress rept.,
by B. Langenecker. May 65, 9p TP-371-Pt-4, NOTS-TP-3829

Descriptors: (*Metals, Ultrasonic radiation), (*Ultrasonic radiation, Deformation), Single crystals, Aluminum, Steel, Plasticity, Tensile properties, Fracture (Mechanics), Transducers, Measurement, Damping, Internal friction, Electron microscopy.

High-intensity ultrasound at 20 kc/sec is used in studies of mechanisms of metal deformation and treatment. Quantitative details about the experimental conditions are provided in the five parts of this report: (1) modes of intense ultrasonic stress waves in rods and bars, (2) conversion of acoustic energy into heat, (3) applications of ultrasound at high strain rate tensile tests, (4) measurements of internal friction during high-intensity ultrasonic radiation of metals, and (5) discussion of ultrasonic metal deformation along with a comparison between our observations and other reports on the subject of ultrasonic metal forming processes.

**AD-464 975** **Field 11F**
**CFSTI Prices: HC$4.00 MF$1.00**
Battelle Memorial Inst., Columbus, Ohio.
**THE FABRICATION OF BERYLLIUM,**
by A. F. Gerds and F. W. Boulger. May 64, 130p
Contract DA-01-021-AMC-203 (Z)
RSIC 227

Descriptors: (*Beryllium, Material forming), (*Material forming, State-of-the-art reviews), Processing, Beryllium alloys, Aluminum alloys, Spacecraft, Physical properties, Deformation, Creep, Extrusion, Sheets, Forging, Powder metallurgy, Drawing (Machine processing), Wire, Casting, Machining, Drills, Milling machines, Saws, Chemical milling, Heat treatment, Stresses, Reduction, Brazing, Bonding, Soldering, Welding, Toxicity, Bibliographies, Rolling (Metallurgy).

This state-of-the-art report is concerned with the fabrication of beryllium and its alloys into space vehicle structures. The report summarizes currently used methods for fabricating the metal into sheets, rods, and other forms. Some of the difficulties that have been encountered in various aspects of fabrication, especially regarding the inherent brittleness of the metal, are enumerated along with the means that have been used to circumvent these problems. The survey includes 102 references to articles and papers in the unclassified literature, most of them having been published since 1960. The data on beryllium prior to 1960 have been covered in two reports issued by the Defense Metals Information Center, DMIC Reports 106 and 168.

**AD-466 429** **Field 11I**
**CFSTI Prices: HC$1.00 MF$0.50**
IIT Research Inst., Chicago, Ill. Technology Center.
**EFFECT OF CUMULATIVE DAMAGE ON THE BIAXIAL COMPRESSIVE FATIGUE PERFORMANCE OF FILAMENT WOUND LAMINATES.**
Quarterly rept. no. 1, 1 Mar-31 May 65,
by C. K. Cole, R. H. Cornish and B. W. Abbott.
Jun 65, 22p
Contract NObs-90329,
Projs. IITRI-M-6081, SR007 03 04,
Task 1008

Descriptors: (*Laminated plastics, Glass textiles), (*Filament wound construction, Laminated plastics), (*Fatigue (Mechanics), Laminated plastics), Composite materials, Compressive properties, Physical properties, Hydrostatic pressure, Test methods, Ultrasonic radiation, Non-destructive testing, Failure (Mechanics).

The preliminary results of a study of cumulative damage effects on the biaxial compressive fatigue performance of glass reinforced plastics (GRP) is reported. Specimen fabrication methods are delineated. A detailed description of the ultrasonic inspection system used is presented. Some preliminary results of successive ultrasonic inspection of specimens fatigue tests in progress are summarized and discussed. (Author)

**AD-466 955** **Field 11F**
**CFSTI Prices: HC$3.00 MF$0.75**
Naval Air Engineering Center, Philidelphia, Pa. Aeronautical Materials Lab.
**EVALUATION OF METALLIC MATERIALS EXPOSED TO THE DEEP OCEAN ENVIRONMENT AT 5640 FEET FOR 123 DAYS,**
by John J. De Luccia and Edward Taylor. 22 Jun 65, 71p NAEC-AML-2132
Task RRMA-02-001/200-1/R007-01-01

Descriptors: (*Alloys, Corrosion), (*Corrosion, Sea water), (*Aluminum alloys, Corrosion), Oceanology, Copper alloys, Magnesium alloys, Beryllium alloys, Steel, Titanium alloys, Stainless steel, Stress corrosion, Manganese alloys, Data, Tables, Mechanical properties, Microstructure, Fracture (Mechanics).

Metallic specimens of 30 different compositions were exposed at a depth of 5640 feet in the Pacific for 123 days and subsequently evaluated for deteriorative effects. Specimens were exposed in the following conditions: (a) heat treated, (b) welded, (c) painted, (d) stressed, and (e) coupled. Corrosion rates were calculated for metals exhibiting uniform general attack (e.g. alloy steels, stainless steels, copper base alloys). Metals exhibiting selective corrosion (e.g. pitting of certain aluminum alloys) were evaluated for frequency and severity of attack. Specific high strength steels and stainless steels stressed at levels below their yield strengths were metallographically examined for evidence of microstructural attack and/or stress corrosion cracking. Routine microscopic examinations (0 to 500X) were made on each alloy system to ascertain the mode of microstructural attack. The mechanical properties (yield strength, tensile strength, % elongation) of the exposed metals are compared with the unexposed control specimens in order to obtain percent reduction in strength data. (Author)

**AD-466 978** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval Ordnance Test Station, China Lake, Calif.
**EFFECTS OF ULTRASOUND ON DEFORMATION CHARACTERISTICS OF STRUCTURAL METALS, 1 JULY 1963-30 JUNE 1964. PART 3. ACOUSTIC SOFTENING AT HIGH STRAIN RATES.**
Technical progress rept.,
by S. R. Colberg and B. Langenecker. Jul 65,
13p TPR-371-Pt-3, NOTS-TP-3828

Descriptors: (*Ultrasonic radiation, Deformation), (*Deformation, Ultrasonic radiation), (*Steel, Deformation), Strain (Mechanics), Tensile properties, Temperatures, Test equipment, Velocity, Data, Material forming.

High-intensity ultrasound at 20 kc/sec is used in studies of mechanisms of metal deformation and treatment. Quantitative details about the experimental conditions are provided in the five parts of this report: (1) modes of intense ultrasonic stress waves in rods and bars, (2) conversion of acoustic energy into heat, (3) applications of ultrasound at high-strain-rate tensile tests, (4) measurements of internal friction during high-intensity ultrasonic radiation of metals, and (5) discussion of ultrasonic metal deformation along with a comparison between our observations and other reports on the subject of ultrasonic metal forming processes. (Author)

**AD-467 015** **Field 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
ARO, Inc., Arnold Air Force Station, Tenn.
**PROPERTY INVESTIGATION OF COPPER BASE ALLOYS AT AMBIENT AND ELEVATED TEMPERATURES,**
by Dennis D. Horn and Henry F. Lewis. Jul 65, 46p
Contract AF40 (600)-1000,
Proj. AF-7778,
Task 777805
AEDC TR-65-72

Descriptors: (*Copper alloys, Physical properties), (*Beryllium alloys, Copper alloys), (*Zirconium alloys, Copper alloys), High-temperature research, Thermal properties, Cold working, Hardening, Heat treatment, Mechanical properties, Thermal conductivity.

An investigation was made to determine the properties of copper base alloys at room and elevated temperatures for high heat flux applications. Literature surveys were conducted to study the properties of copper-beryllium, copper-zirconium, and other commercial grades of copper and copper alloys. These properties were compared with experimental data for copper-zirconium and two alloys of copper-beryllium at temperatures up to 1000F. The test data indicated that the copper-beryllium alloys can be obtained in large sizes with strength levels comparable to survey property levels, whereas for copper-zirconium it was more difficult to reach tabulated strengths because the effectiveness of cold working was reduced for large size billets. The final selection of an alloy depends upon the requirements of a specific application. (Author)

**AD-467 836** **Field 11F, 13H**
**CFSTI Prices: HC$2.00 MF$0.50**
Redstone Scientific Information Center, Redstone Arsenal, Ala.
**EFFECT OF OUTPUT CURRENT WAVEFORM ON THE PROPERTIES OF ALUMINUM WELDS,**
by H. E. Pattee. Apr 65, 40p RSIC-402
Contract DA-01-021-AMC-11706 (Z)
N65 33495

Descriptors: (*Arc welding, Aluminum alloys), (*Aluminum alloys, Welds), (*Power supplies, Arc welding), Electrical properties, Tungsten, Controlled atmospheres, Argon, Helium, Alternating current, Direct current, Electric arcs, Polarization, Waveform generators, Pulse generators, State-of-the-art reviews.

A review of recent studies to determine the effects of power-supply output current waveform on the properties of aluminum welds has been conducted. Current developments in power-supply technology have resulted in the design of welding power sources with unusual output characteristics that significantly affect the behavior of the processes used to weld aluminum. Much of the emphasis has been directed toward the development of alternating-current power sources with square-wave current outputs. Power units that permit variation in the duration of the straight- and reverse-polarity pulses have been designed with the goal of obtaining the benefits associated with the direct-current welding process. Significant improvements in the metal-transfer characteristics of the gas metal-arc process have resulted from the use of pulsed power sources. (Author)

**AD-473 657** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Naval Ordnance Test Station, China Lake, Calif.
**EFFECTS OF ULTRASOUND ON DEFORMATION CHARACTERISTICS OF STRUCTURAL METALS, 1 JULY 1963-30 JUNE 1964. PART 5. DISCUSSION.**
Technical progress rept.,
by B. Langenecker, C. W. Fountain, and S. R. Colberg. Oct 65, 18p TPR-371-Pt-5, NOTS-TP-3941
See also AD-462 609.

Descriptors: (*Metals, Ultrasonic radiation), (*Ultrasonic radiation, Deformation), Tensile properties, Plasticity, Fracture (Mechanics), Stresses, Internal friction, Strain (Mechanics), Transducers, Instrumentation, Degradation, Rods, Material forming, Drawing (Machine processing).

High-intensity ultrasound at 20 kc/sec is used in studies of mechanisms of metal deformation and treatment. Quantitative details about the experimental conditions are provided in the five parts of this report: (1) modes of intense ultrasonic stress waves in rods and bars, (2) conversion of acoustic energy into heat, (3) applications of ultrasound at high strain rate tensile tests, (4) measurements of internal friction during high-intensity ultrasonic radiation of metals, and (5) discussion of ultrasonic metal deformation along with a comparison between our observations and other reports on the subject of ultrasonic metal forming processes.

**ATL-A-143** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
American Radiator and Standard Sanitary Corp. Advanced Technology Labs. Div., Mountain View, Calif.
**INVESTIGATION OF THERMAL-STRESS-FATIGUE BEHAVIOR OF STAINLESS STEELS.**
Quarterly progress rept. no. 10, Apr-Jun 64,
by K. E. Horton and J. M. Hallander. Jun 64,
25p EURAEC-1135
Contract AT (04-3)-250

Descriptors: (*Stainless steel, Fatigue (Mechanics)), (*Fatigue (Mechanics), Thermal stresses).

**ATL-A-144** **Field 11F**
**CFSTI Prices: HC$4.00 MF$1.00**
American Radiator and Standard Sanitary Corp. Advanced Technology Labs. Div., Mountain View, Calif.
**INVESTIGATION OF THERMAL-STRESS-FATIGUE BEHAVIOR OF STAINLESS STEELS.**
Final rept.,
by K. E. Horton and J. M. Hallander. 31 Oct 64,
127p EURAEC-1299
Contract AT (04-3)-250

Descriptors: (*Stainless steel, Thermal stresses), (*Fatigue (Mechanics), Stainless steel).

**BNWL-150** **Field 11B, 11F, 18K**
**CFSTI Prices: HC$4.00 MF$1.00**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**CERAMICS RESEARCH AND DEVELOPMENT QUARTERLY REPORT, APRIL-JUNE 1965.**
Jun 65, 130p
Contract AT (45-1)-1830

Descriptors: (*Reactor fuels, Ceramic materials), (*Ceramic materials, Reactor fuels).

**BNWL-16** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**THE FATIGUE BEHAVIOR OF PU - 1.0 W/O GA DELTA STABILIZED PLUTONIUM,**
by H. R. Gardner. 22 Jan 65, 10p
Contract AT (45-1)-1830

Descriptors: (*Plutonium, Mechanical properties), (*Fatigue (Mechanics), Plutonium).

**C13.10-260-7** **Field 11F, 7B**
**CFSTI Price: MF$0.75**
National Bureau of Standards, Washington, D. C. Inst. for Materials Research.
**STANDARD REFERENCE MATERIALS: METHODS FOR THE CHEMICAL ANALYSIS OF NBS COPPER-BASE SPECTROCHEMICAL STANDARDS,**
by Rosemond K. Bell. 25 Oct 65, 109p NBS Miscellaneous pub-260-7
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.60.

Descriptors: (*Copper alloys, Chemical analysis), (*Chemical analysis, Copper alloys), Standards, Spectroscopy, Test methods, Brass.
The methods for chemical analysis described in this publication are those used in the laboratories of the National Bureau of Standards for the determination of the various constituents of 21 NBS copper-base spectrochemical standards. The methods cover procedures for the analysis of 7 principal standard alloys known as cartridge brass, free-cutting brass, naval brass, red brass, gilding metal, commercial bronze, and aluminum brass of nominal, high, and low composition. The methods are selected or designed primarily for accuracy rather than for speed. References are listed for additional information on chemical analysis of copper-base alloys. (Author)

**CONF-729-4** **Field 11F, 11C**
**CFSTI Prices: HC$2.00 MF$0.50**
IIT Research Inst., Chicago, Ill.
**OXIDATION PROTECTION OF BERYLLIUM AT HIGH TEMPERATURES,**
by Ray J. Van Thyne, John J. Rausch, andJacob M. Miller. 1963, 31p
Contract AT (11-1)-578
Prepared for presentation at International Conference on Beryllium, Philadelphia, Oct 64.

Descriptors: (*Slurry coatings, Beryllium), (*Beryllium, Oxidation).

**COO-1198-161** **Field 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
Illinois Univ., Urbana.
**EFFECTS OF ELECTRODEPOSITED COATINGS ON THE DEFORMATION OF COPPER CRYSTALS,**
by R. J. Block and M. Metzger. 1963, 38p
Contract AT (11-1)-1198

Descriptors: (*Copper, Microstructure), (*Metal coatings, Electrodeposition).

**EURAEC-1102** **Field 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
Centre National de Recherches Metallurgiques, Liege, (Belgium).
**A STUDY ON PLASTIC FATIGUE EMBRITTLEMENT IN REACTOR VESSEL STEELS.**
Quarterly rept. no. 2, 1 Apr-30 Jun 64. 30 Jun 64, 46p
Contract 005-63-12 TEEB

Descriptors: (*Pressure vessels, Steel), (*Steel, Fatigue (Mechanics).

**EURAEC-1148** **Field 11B**
**CFSTI Prices: HC$3.00 MF$0.75**
Nuklear-Chemie Und -Metallurgie G.M.B.H., Wolfgang Bei Hanau Am Main (West Germany).
**DEVELOPMENT OF PROCESSES FOR THE PREPARATION OF URANIUM CARBIDES AS WELL AS CERMETS ON A UC BASE.**
Final rept. no. 3, 1 Jul 62-30 Jun 64,
by P. Himmelstein, M. Kroll, and H. Kuehn. 30 Jun 64, 63p
Contract 088-62-7/RDD

Descriptors: (*Uranium compounds, Carbides), (*Cermets, Industrial production).

**EURAEC-1217** **Field 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
Netherlands. Nijverheidsorganisatie, Tno, The Hague.
**THE DEVELOPMENT OF A NEW DETERMINATION OF THE DUTILE-BRITTLE TRANSITION TEMPERATURE.**
Quarterly rept. no. M 64-890-26150,
by H. C. Van Elst. 30 Oct 64, 41p
Contract 068-61-11-RDN

Descriptors: (*Steel, Transition temperature), (*Industrial research, Steel).

**EURAEC-1218** **Field 11F**
**CFSTI Prices: HC$2.00 MF$0.50**
Battelle Memorial Inst., Geneva (Switzerland).
**THE EFFECT OF RADIATION ON THE DUCTILEBRITTLE TRANSITION IN PRESSURE VESSEL STEELS.**
Quarterly rept. no. 15, 1 Jul-30 Sep 64,
by E. Anderson, D. Brandon, and D. King. Oct 64, 44p
Contract 095-62-12-RDS

Descriptors: (*Pressure vessels, Radiation damage), (*Steel, Mechanical properties).

**GE-TM-64-2-8** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
General Electric Co., Cincinnati, Ohio. Advanced Technology Services.
**ENTHALPY AND THERMAL EXPANSION OF SEVERAL REFRACTORY METALS TO 2500 DEGREE C,**
by J. B. Conway, R. A. Hein, and R. M. Fincell, Jr. Feb 64, 25p
Contract AT (40-1)-2847
CONF 524-18
Prepared for presentation at American Institute of Mining, Metallurgical and Petroleum Enginee RS Annual Meeting, New York, Feb. 1964.

Descriptors: (*Refractory metals, Thermal expansion), (*Enthalpy, Refractory metals).

**MSAR-65-89** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
MSA Research Corp., Callery, Pa.
**STRAIN-ENHANCED DIFFUSION OF CARBON IN STAINLESS STEEL.**
Literature survey,
by R. Hiltz and F. Tepper. 29 Jun 65, 7p
Contract AT (11-1)-765

Descriptors: (*Carbon, Diffusion), (*Stainless steel, Carbon).

**N65-35957** **Field 11D**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**ELEVATED-TEMPERATURE TENSILE PROPERTIES OF ALLOYED TUNGSTEN FIBER COMPOSITES,**
by Donald W. Petrasek. Oct 65, 31p NASA-TN-D-3073

Descriptors: (*Fiber metallurgy, Tensile properties).

**N65-35964** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**PREPARATION OF LOW-CARBON-CONTENT IRON FOR USES AN ACCELERATOR FOR CARBON DETERMINATIONS,**
by Emergy J. Merkle and Judson W. Graab. Oct 65, 5p NASA-TM-X-1164

Descriptors: (*Induction heating, Carbon).

**N66-10333** **Field 11A**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**EXPERIMENTAL STUDY OF END EFFECT AND PRESSURE PATTERNS IN HELICAL GROOVE FLUID FILM SEAL (VISCOSEAL).**
Technical note,
by Lawrence P. Ludwig, Thomas N. Strom, and Gordon P. Allen. Nov 65, 20p NASA-TN-D-3096

Descriptors: (*Seals, Experimental data).

**N66-10338** **Field 11G, 9A**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**HYSTERESIS AND EDDY-CURRENT LOSSES OF A TRANSFORMER LAMINATION VIEWED AS AN APPLICATION OF THE POYNTING THEOREM.**
Technical note,
by John Barranger. Nov 65, 18p NASA-TN-D-3114

Descriptors: (*Transformers, Laminates).

**N66-10339** **Field 11C, 22B**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**SPECTRAL EMITTANCE OF ALUMINUM OXIDE AND ZINC OXIDE ON OPAQUE SUBSTRATES.**
Technical note,
by Curt H. Liebert. Nov 65, 22p NASA-TN-D-3115

Descriptors: (*Ceramic coatings, Spacecraft), (*Emissivity, Coatings), Thermal radiation, Surface properties.

**N66-10415** **Field 11F**
**CFSTI Prices: HC$0.35 MF$0.50**
Battelle Memorial Inst., Columbus, Ohio.
**TUNGSTEN POWDER METALLURGY.**
Technology utilization rept.,
by V. D. Barth and H. O. McIntire. Nov 65, 39p NASA SP-5035

Descriptors: (*Tungsten, Powder metallurgy), (*Powder metallurgy, Tungsten).

**N66-10606** **Field 11F, 1C**
**CFSTI Prices: HC$3.00 MF$0.75**
LTV Vought Aeronautics Div., Ling-Temco-Vought, Inc., Dallas, Tex.
**FATIGUE BEHAVIOR OF Ti-8Al-1Mo-1V SHEET IN A SIMULATED WING STRUCTURE UNDER THE ENVIRONMENT OF A SUPERSONIC TRANSPORT.**
Contractor rept.,
by John J. Peterson. Nov 65, 85p
Contract NAS1-2998
NASA CR-333

Descriptors: (*Titanium alloys, Supersonic planes), (*Wings, Titanium alloys), Aluminum alloys, Molybdenum alloys, Vanadium alloys.

**N66-13231** **Field 11F, 20K**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**FATIGUE-CRACK PROPAGATION AND RESIDUAL STATIC STRENGTH OF PH 15-7 Mo (TH 1050) STAINLESS STEEL.**
Technical note,
by C. Michael Hudson. Dec 65, 31p NASA-TN-D-3151

Descriptors: (*Fatigue (Mechanics), Stainless steel), (*Stainless steel, Stresses).

**NYO-2394-12** **Field 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Brown Univ., Providence, R. I. Div. of Engineering.
**A STUDY OF THE MECHANICAL PROPERTIES OF HIGH-COBALT CEMENTED TUNGSTEN CARBIDES,**
by K. N. Tu and J. Gurland. Jan 65, 19p
Contract AT (30-1)-2394

Descriptors: (*Cobalt alloys, Mechanical properties), (*Tungsten compounds, Carbides).

**Patent 3,219,441** **Field 11F, 18J**
**PROCESS OF PREPARING THORIUM METAL FROM THE OXIDE.**
Patent assigned to AEC,
by James B. Knighton and Alleppey V. Hariharau. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Thorium, Refining (Metallurgy)), Thorium compounds, Dioxides, Reduction (Chemistry), Fluxes (Fusion), Calcium compounds, Magnesium compounds, Chlorides, Fluorides, Magnesium alloys, Zinc alloys, Patents.

Identifiers: Calcium chloride, Calcium floride, Magnesium chloride, Thorium oxide.

The process includes mixing thorium dioxide, zinc, magnesium, and a molten flux containing from 11 to 100 mole percent of magnesium chloride, from 0 to 15 mole percent of calcium fluoride and from 89 to 0 mole percent of calcium chloride at a temperature of between 650 and 900 degrees C. The reaction mixture is then agitated, whereby the thorium dioxide is reduced to thorium metal and the thorium metal is taken up by the molten magnesium-zinc; and separating the thorium-magnesium-zinc alloy from the flux.

**Patent 3,219,584** **Field 11K**
**WETTING AGENTS AND SURFACE ACTIVE COMPOSITIONS THEREFROM.**
Patent assigned to Agriculture,
by Alexander J. Stirton, Raymond G. Bistline, Jr., James K. Weil and Waldo C. Ault. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Surface-active substances, Preparation), (*Sulfonates, Surface-active substances), Fatty acid esters, Sodium compounds, Phosphates, Sulfates, Silicates, Patents.

The invention relates to highly efficient wetting agents which are salts of esters of alpha sulfonated fatty acids, to surface active composition containing one or more of these wetting agents as an essential component, and to synergistic combinations containing these wetting agents. An object of the invention is to provide wetting agents having a wetting time in the Draves test of less than 10 seconds, preferably less than six seconds. Another object is to provide wetting agents which have good solubility in both water and in oil. A further object is to provide improved wetting agents which exhibit stability under acidic or alkaline conditions, even at elevated temperatures. The wetting agents are the sodium, potassium or ammonium salts of alkyl or fluoroalkyl esters of alpha sulfo fatty acids.

**Patent 3,219,612** **Field 11I, 11J**
**VINYL CHLORIDE RESINS AND BUTADIENE RUBBERS WITH N-ACYL DERIVATIVES OF CYCLIC IMINES.**
Patent assigned to Agriculture,
by Evald L. Skau, Robert R. Mod and Frank C. Magne. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Plasticizers, N-heterocyclic compounds), (*Polyvinyl chloride, Plasticizers), (*Butadienes, Plasticizers), (*Synthetic rubber, Additives), Imines, Fatty acids, Nitrile rubber, Additives, Oleic acids, Piperidines, Patents.

Identifiers: Softening agents.

The invention relates to certain compounds which are N-acyl derivatives of cyclic imines, to some unique mixtures of N-acyl derivatives of cyclic imines, and to plastic compositions, the plasticizer component of which is at least one of the compounds or one of the unique mixtures. The compounds and mixtures of compounds that are the subject of this invention are efficient primary solvent-type plasticizers which can be made from low price fatty acids and which exhibit good compatibility with and impart low volatility loss, resistance to microbial action, excellent low temperature properties, and stability to northern light exposure to polymer and copolymer resins of vinyl chloride. The compounds are also efficient, compatible softeners for Buna N rubber, imparting low volatility loss and excellent low temperature properties to the plasticized rubber compositions.

**Patent 3,219,614** **Field 11I**
**VINYL CHLORIDE RESINS PLASTICIZED WITH N-ACYL DERIVATIVES OF SUBSTITUTED PIPERIDINE.**
Patent assigned to Agriculture,
by Evald L. Skau, Robert R. Mod and Frank C. Magne. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Plasticizers, N-heterocyclic compounds), (*Polyvinyl chloride, Plasticizers), (*Piperidines, Plasticizers), Imines, Fatty acids, Additives, Patents.

The invention relates to certain compounds which are N-acyl derivatives of cyclic imines, to some unique mixtures of N-acyl derivatives of cyclic imines, and to plastic compositions, the plasticizer component of which is at least one of the compounds or one of the unique mixtures. The compounds and mixtures of compounds that are the subject of this invention are efficient primary solvent-type plasticizers which can be made from low price fatty acids and which exhibit good compatibility with and impart low volatility loss, resistance to microbial action, excellent low temperature properties, and stability to northern light exposure to polymer and copolymer resins of vinyl chloride. Specific examples of such plasticizers include N-2-ethychexanoyl piperidine and N-oleoyl-4-propyl piperidine.

**Patent 3,219,632** **Field 11E**
**WATER SOLUBLE CARBAMATE-FORMALDEHYDE CONDENSATE.**
Patent assigned to Agriculture,
by John G. Frick, Jr., Richard L. Arceneaux and John David Reid. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Textiles, Additives), (*Carbamic acids, Textiles), (*Formaldehyde, Textiles), Cotton textiles, Rayon, Deformation, Inhibition, Condensation reactions, Patents.

Identifiers: Carbamates, Wrinkel-proofing agents.

Cellulosic textiles are treated to make them wrinkle resistant and to give improved smooth drying properties after laundering. The product for treating the textile is formed from the reaction of a monocarbonate, such as methyl carbamate, and two moles of formaldehyde. Specific examples of such products are methyl-, ethyl-, propyl-, and butylcarbamate.

**Patent 3,219,653** **Field 11I**
**METHODS OF OXYGEN-PROOFING OF POLYETHYLENES.**
Patent assigned to Navy,
by James N. Henderson. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Polyethylene plastics, Protective coatings), Antioxidants, Corrosion inhibition, Catalysts, Acetic acids, Patents.

A linear chain, high density, low pressure polyethylene is made resistant to oxidation by immersing it in glacial acetic acid at from 90 to 100 degrees C. for about 3 hours.

**Patent 3,219,659** **Field 11I, 11J**
**N-OLEOYL-2-ETHYLETHYLENIMINE.**
Patent assigned to Agriculture,
by Evald L. Skau, Robert M. Mod, and Frank C. Magne. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Polyvinyl chloride, Plasticizers), (*Synthetic rubber, Additives), (*Plasticizers, N-heterocyclic compounds), (*N-heterocyclic compounds, Plasticizers), Piperazines, Imines, Fatty acids, Butadienes, Nitrile rubber, Patents.

Identifiers: Oleoyl ethyl ethyleneimines, Softening agents.

The compounds are useful as plasticizers for vinyl chloride resins and as softeners for Buna N rubber. N-oleoyl-2-ethylethylenimine is the only product claimed.

**Patent 3,219,664** **Field 11I**
**MORPHOLIDES OF EPOXIDIZED FATTY ACIDS.**
Patent assigned to Agriculture,
by Frank C. Magne, Evald L. Skau and Robert R. Mod. 23 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Polyvinyl chloride, Plasticizers), (*Plasticizers, O-heterocyclic compounds), (*O-heterocyclic compounds, Plasticizers), Fatty acids, Amides, Oleic acids, Stearic acids, N-heterocyclic compounds, Patents.

Identifiers: Diepoxy octadecanoic acids, Epoxides, Epoxy octadecanoic acids, Epoxy oleic acids, Morpholides.

Morpholides are provided of mixtures of long chain saturated and unsaturated fatty acids that are made from fatty acids found in natural glycerides. The mixed morpholides are plasticizers for polymers and copolymers of vinyl chloride. The morpholides of epoxyoleic, epoxystearic acid and diepoxystearic acid are claimed.

## 12. MATHEMATICAL SCIENCES

**LA-3401** **Field 12A, 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
Los Alamos Scientific Lab., Univ. of California, N. Mex.
**ON FREQUENCY DISCRETIZATION AND CONSERVATIVE DIFFERENCE EQUATIONS FOR RADIATIVE TRANSFER,**
by Burton Wendnoff. 20 Sep 65, 18p
Contract W-7405-eng-36

Descriptors: (*Protons, Integral equations), (*Difference equations, Protons).

**N65-20795** **Field 12A**
**CFSTI Prices: HC$3.00 MF$0.75**
Catholic Univ. of America, Washington, D. C.
**CONFORMAL MAPPING OF A CLASS OF DOUBLY CONNECTED REGIONS.**
Technical rept. no. 8,
by Patricio A. Laura. Jan 65, 75p
Grant NsG-125-61
NASA CR-57707

Descriptors: (*Conformal mapping, Integral equations).

**N65-25347** **Field 12A**
**CFSTI Prices: HC$3.00 MF$0.50**
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
**AUXILIARY ESTIMATING FUNCTIONS FOR DOUBLY TRUNCATED NORMAL SAMPLES,**
by J. David Lifsey. 21 May 65, 52p NASA-TMX-53221

Descriptors: (*Statistical functions, Sampling).

**N65-35951** **Field 12A**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**SATISFACTION OF ASYMPTOTIC BOUNDARY CONDITIONS IN NUMERICAL SOLUTION OF SYSTEMS OF NONLINEAR EQUATIONS OF BOUNDARY-LAYER TYPE,**
by Philip R. Nachtsheim and Paul Swigert. Oct 65, 36p NASA-TN-D-3004

Descriptors: (*Boundary value problems, Fluid mechanics).

**N65-35962** **Field 12B**
**CFSTI Prices: HC$3.00 MF$0.75**
Stanford Univ., Calif.
**STABILITY ANALYSIS OF RELAY-CONTROL SYSTEMS VIA THE DIRECT METHOD OF LYAPUNOV,**
by Stein Weissenberger. Oct 65, 87p
Grant NsG-133-61
NASA CR-320

Descriptors: (*Control systems, Stability).

Identifiers: Lyapunov method.

**UCRL-12411** **Field 12A, 20C, 20M**
**CFSTI Prices: HC$2.00 MF$0.50**
Lawrence Radiation Lab., Univ. of California, Livermore.
**FINITE DIFFERENCE METHODS FOR NONLINEAR RADIATION TRANSPORT,**
by Phillip M. Campbell. 20 Aug 65, 23p
Contract W-7405-eng-48

Descriptors: (*Numerical methods and procedures, Transport properties).

## 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

**ACF-4** **Field 13H**
**CFSTI Prices: HC$1.00 MF$0.50**
ACF Industries, Inc., Albuquerque, N. Mex.
**ULTRASONIC TESTING,**
by F. W. Jarrett. 15 Feb 65, 17p CONF-650109-1
Contract AT (29-1)-1352
Prepared for presentation at Golden Gate Section of the Society for Nondestructive Testing in San Francisco.

Descriptors: (*Non-destructive testing, Ultrasonic radiation), (*Ultrasonic radiation, Non-destructive testing).

**AD-466 191** **Field 13M, 8H, 2E**
**CFSTI Prices: HC$1.00 MF$0.50**
Bureau of Reclamation, Denver, Colo. Hydraulics Branch.
**HYDRAULIC MODEL STUDIES OF YELLOWTAIL AFTERBAY DAM SPAWNING CHANNEL STILLING BASIN AND DIFFUSER CHAMBER, MISSOURI RIVER BASIN PROJECT, MONTANA,**
by G. L. Beichley. 30 Mar 65, 23p Hyd-525

Descriptors: (*Hydraulic models, Dams), (*Dams, Fishes), (*Diffusers, Dams), Fluid flow, Pipes, Design, Montana.

Hydraulic model studies of the spawning channel stilling basin and diffuser chamber at Yellowtail Afterbay Dam in Montana resulted in the use of a slotted baffle near the intake conduit to provide satisfactory stilling action and good flow distribution. Flow enters the spawning channel through a 4-ft-dia intake conduit, passes through a stilling basin, and upward through a diffuser grating into the resting pool at the upstream end. Of the 150-cfs design flow, 30 will be discharged through a 24-in. bypass pipe to lower part of the fish ladder, 20 into the upstream end of the fish ladder, and the rest into the spawning channel. The slotted baffle diffuser was developed for the stilling basin to replace floor block and stepped end sill of the original design. This provided a relatively stable water surface in the basin and good flow distribution from the diffuser chamber into the resting pool, so that flow into and through the pool was quiet. The modified stilling basin and diffuser chamber performed well for any possible operating combination of head and tailwater. To quiet flow from the bypass pipe from main stilling basin before discharging it at right angles into the fish ladder, the bypass diffuser chamber was widened and a seawall-type cover was provided at the downstream end to reduce turbulence. (Author)

**CONF-641201-16** **Field 13D**
**CFSTI Prices: HC$2.00 MF$0.75**
Franklin Inst., Philadelphia, Pa.
**IMPACT RESISTANCE OF CASKS.**
by H. F. Clarke, Jr. 1963, 41p
Contract AT (30-1)-1484
Prepared for presentation at Americal Institute of Chemical Engineers Annual Meeting, Boston.

Descriptors: (*Impact shock, Containers), (*Containers, Shock resistance).

**EURAEC-1097** **Field 13H**
**CFSTI Prices: HC$4.00 MF$0.75**
Arcos, S. A., Brussels (Belgium).
**A STUDY ON RESIDUAL STRESSES GENERATED BY THE UPWARD VERTICAL WELDING PROCESS.**
Quarterly repts. no. 10 and no. 11, 1 Apr-30 Sep 64.
30 Sep 64, 103p EURAEC-1214
Contract 053-61-12-RDB

Descriptors: (*Welding, Stresses), (*Metal plates, Welding).

**EURAEC-1106** **Field 13H**
**CFSTI Prices: HC$6.00 MF$1.25**
Ghent Rijksuniversiteit (Belgium).
**WELDING OF VERY THICK STEELS.**
Quarterly report no. 11, 1 Apr-30 Jun 64.
30 Jun 64, 228p
Contract 042-61-9RDB

Descriptors: (*Steel, Thickness), (*Welding, Steel).

**EURAEC-1166** **Field 13H, 11F**
**CFSTI Prices: HC$3.00 MF$0.75**
Schweisstechnische Lahr-Und Versuchsanstalt, Duisburg (Germany).
**ELECTRO-SLAG WELDINGS OF REACTOR STEELS.**
Technical quarterly rept. no. 12, 1 Apr-30 Jun 64.
23 Jul 64, 96p
Proj. 221
EURAEC 1166

Descriptors: (*Steel, Welding), (*Welds, Metallography).

**EURAEC-1228** **Field 13H**
**CFSTI Prices: HC$1.00 MF$0.50**
Neratoom, N. V., The Hague (Netherlands).
**STAINLESS STEEL CLADDING OF VERY THICK STEELS.**
Quarterly report no. 1, 1 Jul-30 Sep 64.
22 Oct 64, 20p
Contract 008-63-12TEEB (RD)

Descriptors: (*Steel, Thickness), (*Cladding, Stainless steel).

**EURAEC-1242** **Field 13H**
**CFSTI Prices: HC$3.00 MF$0.75**
Schweisstechnische Lehr-Und Versuchsanstalt, Duisburg, (Germany).
**ELECTRO-SLAG WELDING OF REACTOR STEELS.**
Quarterly rept. no. 14, 1 Jul-30 Sep 64.
21 Oct 64, 93p

Descriptors: (*Steel, Welding), (*Welds, Heat treatment).

**LA-3240** **Field 13K**
**CFSTI Prices: HC$2.00 MF$0.50**
Los Alamos Scientific Lab., Univ. of California, N. Mex.
**AN EXPERIMENTAL DC ELECTROMAGNETIC PUMP FOR A MOLTEN PLUTONIUM ALLOY,**
by Gary L. Caldwell. 1 Aug 65, 37p
Contract W-7405-eng-30

Descriptors: (*Electromagnetic pumps, Direct current), (*Plutonium alloys, Electromagnetic pumps).

**N65-33365** **Field 13H**
**CFSTI Price: MF$0.50**
Hayes International Corp., Huntsville, Ala. Missile and Space Support Div.
**METAL-FORMING TECHNIQUES,**
by Ilia I. Islamoff. May 65, 59p
NASA SP-5017
Hardcopy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.40.

Descriptors: (*Metal-forming presses, Operation).

**N65-35069** **Field 13H**
**CFSTI Prices: HC$1.00 MF$0.50**
Cornell Univ., Ithaca, N. Y.
**THE DYNAMICS OF CRYOSORPTION PUMPING.**
Contractor rept.,
by S. H. Bauer and Peter Jeffers. Oct 65, 9p
Grant NsG-116
NASA CR-314

Descriptors: (*Cryopumping, Dynamics).

**N66-12344** **Field 13H, 9A**
**CFSTI Prices: HC$0.50 MF$0.25**
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
**THE ELECTROMAGNETIC HAMMER.**
Technology utilization rept.
Dec 65, 22p
NASA SP-5034

Descriptors: (*Magnet coils, Material forming), (*Material forming, Hammers).

**N66-12527** **Field 13I**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**BEARING LIFE AND FAILURE DISTRIBUTION AS AFFECTED BY ACTUAL COMPONENT DIFFERENTIAL HARDNESS.**
Technical note,
by Erwin V. Zaretsky, Richard J. Parker, William J. Anderson and David W. Reichard. Nov 65, 19p NASA-TN-D-3101

Descriptors: (*Ball bearings, Life expectancy), (*Failure (Mechanics), Ball bearings), Hardness.

**NYO-2539-3** **Field 13D**
**CFSTI Prices: HC$1.00 MF$0.50**
Franklin Inst., Philadelphia, Pa. Labs. for Research and Development.
**STRUCTURAL INTEGRITY OF SHIPPING CONTAINERS FOR RADIOACTIVE MATERIALS. PART IV. A DISCUSSION OF APPROACHES TO THE VEHICLECOLLISION PROBLEM,**
by K. D. Doshi. Dec 64, 20p
Contract AT (30-1)-2539

Descriptors: (*Containers, Transportation), (*Radioactive isotopes, Containers).

**NYO-3337-16** **Field 13H, 18D**
**CFSTI Prices: HC$1.50 MF$1.00**
Little (Arthur D.) Inc., Cambridge, Mass.
**ISOTOPES IN INDUSTRY. TRENDS IN THE INDUSTRIAL USE OF RADIOISOTOPES AND IONIZING RADIATION.**
Final rept.,
by B. W. Stone, J. H. B. George and H. P. Beutner. 24 Sep 65, 140p
Contract AT (30-1)-3337

Descriptors: (*Nuclear industrial applications, Effectiveness).

**Patent 3,217,497** **Field 13K, 2C**
**AUTOMATIC IRRIGATION GATE.**
Patent assigned to Agriculture.
by Allan S. Humpherys and James A. Bondurant.
16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Gate valves, Irrigation systems), Patents, Automatic.

The swinging gate across an irrigation ditch is rotatable about a horizontal axis. A locking mechanism keeps the gate normally closed when not in use until automatically released. When in use, the gate acts as an automatic check or dam to raise the water level in the ditch for distribution to the field through outlets in the ditch bank upstream from the gate. When it is desired to irrigate the field below the dam, the gate release mechanism is automatically actuated and water pressure behind the gate forces it open and permits water to flow down to the next such gate.

**Patent 3,221,508** **Field 13A, 20C**
**FLEXIBLE COLD SIDE FOR THERMOELECTRIC MODULE.**
Patent assigned to Navy,
by John B. Roes, William J. Gauld and Erik S. Pedersen. 7 Dec 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Thermoelectricity, Heat transfer), (*Thermocouples, Heat transfer), Electric currents, Patents, Flexible structures, Temperature control, Heat sinks.

The system is formed of a plurality of thermocouples which are so arranged as to provide for the efficient flow of heat and electric current with optimum performance. The assembly of thermoelectric elements, having a cold junction of improved construction, provides for the heat transfer between the thermoelectric elements and a device which is to be kept at a predetermined temperature.

**PB-169 207** **Field 13M**
**CFSTI Prices: HC$4.00 MF$0.75**
Illinois Univ., Urbana.
**A NONLINEAR PROGRAMMING APPROACH TO THE MINIMUM WEIGHT ELASTIC DESIGN OF STEEL STRUCTURES.**
Structural research series on civil engineering studies,
by D. M. Brown and A. Ang. Oct 65, 123p
SRS-298
Grant NSF-GP-700

Descriptors: (*Steel, Structures), (*Structures, Elasticity), Nonlinear programming, Weight, Design.

A flexible technique has been developed for obtaining the minimum weight design of indeterminate rigid frames and trusses based on the assumption of elastic behavior. This has been accomplished by assuming that the structures are to be fabricated from commercially available steel sections. By obtaining approximate relationships among the necessary section properties, the number of constraints on stresses and deflections are reduced to a relatively small number; the objective function is formulated in terms of the weight of the structure. The resulting constraints and objective function define a nonlinear programming problem which is an approximation to the original design problem and which can be solved by means of the gradient projection method of nonlinear programming. The solution of the nonlinear programming problem, called the 'continuous solution,' may be thought of as a first approximation to the solution of the original design problem. On the basis of the continuous solution an 'available solution' is obtained from the combination of available sections that gives the least weight structure. (Author)

## 14. METHODS AND EQUIPMENT

**AD-449 746** **Field 14B**
**CFSTI Price: HC$2.00**
Navy Electronics Lab., San Diego, Calif.
**ACOUSTIC TRANSDUCER EVALUATION CENTER (TRANSDEC). NONREVERBERATING POOL DEVELOPED AT NEL FOR CALIBRATION AND EVALUATION.**
Research and development rept.,
by C. E. Green. 24 Aug 64, 32p NEL-1232
Proj. SF-001-03-04,
Task 8049 (NEL-L3-1)

Descriptors: (*Electroacoustic transducers, Anechoic chambers), (*Anechoic chambers, Test facilities), (*Test facilities, Anechoic chambers), Calibration, Analog computers, Theory, Specifications, Underwater sound equipment, Acoustic ranges, Sonar equipment, Test methods, Naval research laboratories.

An anechoic pool designed and build at NEL behaves as an infinite body of water. It permits complete analog evaluation on station of acoustic transducers of normal frequency range, size, and weight. (Author)

**AD-466 577** **Field 14E, 20F**
**CFSTI Prices: HC$3.00 MF$0.75**
Itek Corp., Lexington, Mass.
**STUDY OF IMAGE-EVALUATION TECHNIQUES.**
Interim engineering rept. no. 12, 15 Apr-15 Jul 65,
15 Jul 65, 73p Itek-65-9048-13
Contract AF33 (657)-9158

Descriptors: (*Aerial photography, Photointerpretation), Aerial reconnaissance, Theory, Optics, Photographic images, Mathematical models, Photographic lenses, Photographic emulsions, Resolution, Programming (Computers), Statistical analysis.

The primary goal of this program is the development of a valid computational means for determining object to image relationships in photo-optical reconnaissance systems. Our attention is currently restricted to the lens-film combination. The investigation has been primarily based on linear transfer function, or spatial frequency, analysis. In the area of lens response, the basic linearity of the optical system makes this analysis valid, if not completely sufficient (e.g., veiling glare is not accounted for by the lens transfer function). In the areas of film response, nonlinear analysis must be resorted to in order to account for the fundamental nonlinearity attested to by the D-log E curve as well as for the much less well understood effects of finite chemical diffusion rate properties commonly called adjacency effects. Because of the many problems in film response analysis, the major emphasis in the program is on emulsion studies. Our research activity is generally separable into lens, film, lens-film system, and computer programming categories. In essence, our experimental and theoretical studies in the lens, film, and lens-film system areas are to provide the conceptual and practical foundations for a computer program that will make possible the calculation of object to image relationships in general lens-film systems. (Author)

**BDX-613-43** **Field 14B, 15C**
**CFSTI Prices: HC$1.00 MF$0.50**
Bendix Corp., Kansas City, Mo.
**A STANDARDS AND CALIBRATION PROGRAM IN A LARGE DEFENSE PLANT,**
by J. F. Hadley. Nov 63, 12p CONF-631108-1
Contract AT (29-1)-613
Prepared for presentation at IEEE Symposium on Measurements and Instrumentation, Kansas City, Mo.

Descriptors: (*Industrial plants, Standards), (*Defense systems, Calibration).

N65-24042 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
General Precision, Inc., Binghamton, N. Y. Link Div.
**DESIGN STUDY FOR VISUAL CUE SIMULATOR.**
Addendum to final rept.,
6 Dec 63, 23p
Contract NAS1 1904
NASA CR-53600

Descriptors: (*Simulators, Vision).

N65-35956 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**A NOTE ON WIRE IGNITION IN COMBUSTION-HEATED DRIVERS FOR SHOCK-TUNNEL APPLICATION,**
by David A. Stewart and Robert E. Dannenberg.
Oct 65, 26p NASA-TN-D-3063

Descriptors: (*Combustion chambers, Wind tunnels).

N65-36766 Field 14B
CFSTI Prices: HC$2.00 MF$0.50
Midwest Research Inst., Kansas City, Mo.
**EXTREME VACUUM TECHNOLOGY DEVELOPMENTS,**
by Paul J. Bryant, Charles M. Gosselin andWilliam W. Longley, Jr. Nov 65, 8p
Contract NASr-63 (06)
NASA CR-324

Descriptors: (*Vacuum apparatus, Design).

N66-10336 Field 14B
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**EVALUATION OF A VOLUME-RATIO CALIBRATION SYSTEM FOR VACUUM GAGES FROM 0.000001 TO 0.001 TORR.**
Technical note,
by Raymond Holanda. Nov 65, 17p NASA-TN-D-3100

Descriptors: (*Vacuum apparatus, Pressure gages), (*Pressure gages, Calibration).

PB-168 622 Field 14B, 7B, 11B, 20K, +
CFSTI Prices: HC$1.25 MF$0.50
Naval Research Lab., Washington, D. C.
**REPORT OF NRL PROGRESS.**
Nov 65, 48p
Also available on subscription from CFSTI, $10.00 per year domestic, $13.00 per year foreign.

Descriptors: (*Naval research, Reports), (*X-ray spectroscopy, Quantitative analysis), (*Dosimeters, Bromine compounds), Alkaline earth compounds, Potassium compounds, Astrophysics, Chemistry, Mechanics, Metallurgy, Ceramic materials, Nuclear physics, Optics, Radio communication systems, Work functions, Electron beams.

Complete papers: Energy dispersion for quantitative x-ray spectrochemical analysis; and chemical dosimetry-- the alkaline hypobromite and potassium bromate dosimeters. Summaries are given of research in the following fields: atmosphere and astrophysics, chemistry, mechanics, metallurgy and ceramics, nuclear and atomic physics, optics, and radio.

PB-168 986 Field 14B, 7B, 11B, 20K, +
CFSTI Prices: HC$1.25 MF$0.50
Naval Research Lab., Washington, D. C.
**REPORT ON NRL PROGRESS.**
Dec 65, 45p
Also available on subscription from CFSTI, $10.00 per year domestic, $13.00 per year foreign.

Descriptors: (*Naval research, Reports), (*Solar cells, Radiation damage), (*Work functions, Measurement), (*Electron beams, Work functions), Silicon, Semiconductors, Scanning, Display systems, Identification systems, Radar equipment, Gratings (Optics), Astrophysics, Chemistry, Electricity, Mechanics, Metallurgy, Nuclear physics, Optics, Radio communication systems.

Complete papers: Thermal annealing of irradiated n-on-p silicon solar cells; and electron beam scanning technique for measuring surface work functions variations. Summaries are given of research in the following fields: atmosphere and astrophysics, chemistry, electricity, mechanics, metallurgy, nuclear and atomic physics, optics, and radio.

PB-169 123 Field 14B
CFSTI Prices: HC$1.25 MF$0.50
Naval Research Lab., Washington, D. C.
**REPORT ON NRL PROGRESS.**
Jan 66, 46p
Also available on subscription from CGSTI, $10.00 per year domestic, $13.00 per year foreign.

Descriptors: (*Naval research, Reports), (*Lubricants, Ice), Fracture (Mechanics), Toughness, Strain (Mechanics), Hardening, Astrophysics, Ceramic materials, Metallurgy, Electron beam melting, Refractory metals, Radio, Solid state physics, Sound.

Contents: Articles; Factors Affecting the Icing Resistance of Lubricants for Aircraft, by H. R. Baker and R. N. Bolster, A Rate 'Spectrum' of Strain Hardenability and of Fracture Toughness, by J. M. Krafft, Scientific Program; atmosphere and astrophysics, metallurgy and ceramics, radio, solid state physics, and sound.

## 16. MISSILE TECHNOLOGY

Patent 3,218,405 Field 16C
**INERTIALLY RESPONSIVE SWITCHES.**
Patent assigned to Navy,
by Charles Young, Jr. 16 Nov 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Arming devices, Guided missiles), Patents, Inertia, Acceleration, Safety devices.

The escapement controlled, inertially responsive safety and arming switch is for use in missiles. All moving parts with the exception of the inertial mass 'sees' its design acceleration. The escapement is not exercised by spurious random accelerations.

Patent 3,221,602 Field 16A
**LIQUID SPRING MOUNTING MEANS FOR A LAUNCHING TUBE.**
Patent assigned to Navy,
by Wilson T. Price and Charles R. Brown. 7 Dec 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Guided missile launchers, Springs), Vibration, Vibration isolators, Attenuation, Guided missiles (Surface-to-surface), Patents.

The launching tube for a missile is used on a moving ship or land vehicle. The liquid spring mounting protects a missile from launcher-induced vibrations due, for example, to the depth charging of a submarine. Vibration attenuating material absorbs the vehicle-induced vibrations, thereby protecting the inner tube of the launcher and the missile from damage.

Patent 3,221,656 Field 16C
**APPARATUS FOR HIGH-VELOCITY RECOVERY.**
Patent assigned to Army,
by Adriam P. Sutten. 7 Dec 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Payload, Recovery), (*Recovery vehicles, Payload), Parachutes, Drag parachutes, Patents.

The recovery package is for safely recovering a payload from a high-velocity vehicle traveling in a flat trajectory under powered flight. The system employs a drag parachute and a main parachute, the deployment times of both parachutes being presettable before launch.

## 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

AD-466 779 Field 17I
CFSTI Prices: HC$2.00 MF$0.50
Harry Diamond Labs., Washington, D. C.
**MILLIMETER WAVE STUDIES.**
Status rept. for 1 Sep 63,
by Dominic S. D'Angona and William L. Kieffer.
16 Sep 64, 49p TR-1179
Projs. DA-1P222901A207, HDL-A0262

Descriptors: (*Radar, Portable), (*Search radar, Portable), Millimeter waves, Range finding, Automatic, Resolution, Radiofrequency, Target recognition, Design, Attenuation, Radar equipment, Performance (Engineering).

A Millimeter-Wave Study has been in progress at HDL to investigate atmospheric phenomena and possible ranging applications at millimeter-wave frequencies. Major effort has been directed toward designing and evaluating a 70-Gc radar detection unit that would enhance target identification with minimized size, weight, and power consumption. This study was temporarily suspended, however, before completing the program objectives. Therefore, in addition to presenting a description of the unit and its performance, this report also outlines certain design improvements that are considered applicable in a further development program. The unit under development is self-contained in a rectangular volume 2800 cu in. including the antenna, weighs less than 25 lb, and operates continuously for 1 hr on its internal battery; it has an antenna beamwidth of less than 0.6 deg and a total power consumption of approximately 100 w. The system is constructed to measure range and atmospheric attenuation (absorption), based on elapsed-time indications and variations in signal-path attenuation. By using an optical arrangement that is aligned with the radiated beam from a common transmit and receive antenna, the operator has a visual and electrical presentation of the field of coverage. (Author)

N65-14540 Field 17B, 22B
CFSTI Prices: HC$2.00 MF$0.50
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
**LUNAR COMMUNICATIONS,**
by E. Rechtin. 28 Jun 63, 43p JPL-TR-33-133
Contract NAS7-100
NASA CR-60049

Descriptors: (*Moon, Space communication systems), (*Television communication systems, Moon).

**N66-10317** **Field 17B, 22B**
**CFSTI Prices: HC$2.00 MF$0.50**
Aeronautical Research Associates of Princeton, Inc., N. J.
**COMMUNICATION PROBABILITIES FOR ORDERLYSPACED SATELLITES.**
Contractor rept.,
by John C. Houbolt. Nov 65, 30p
Contract NAS1-4585
NASA CR-327

Descriptors: (*Space communication systems, Satellites (Artificial)), (*Satellites (Artificial), Space communication systems).

**N66-10381 - N66-10407** **Field 17I**
**CFSTI Prices: HC$1.75 MF$1.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**SHORT-TERM FREQUENCY STABILITY.**
23-24 Nov 64, 317p NASA-SP-80
Proceedings of IEEE-NASA Symposium on Definition and Measurement of Short-Term Frequency Stability held at Goddard Space Flight Center, Greenbelt, Md., 23-24 Nov 64.

Descriptors: (*Frequency stabilizers, Standards), (*Doppler radar, Frequency stabilizers).

**PB-169 196** **Field 17G, 1E**
**CFSTI Prices: HC$2.00 MF$0.50**
ITT Federal Labs., Nutley, N. J.
**DIRECTIONAL GLIDE-SLOPE ANTENNA SYSTEM.**
Interim rept.,
by R. Heinick, G. Lehman, and F. W. Iden. Sep 65, 37p
Contract FA-WA-4465,
Proj. FAA-320-101-01N (114-11)
SRDS RD-65-11

Descriptors: (*Glide path systems, Performance (Engineering)), (*Antenna arrays, Glide path systems), Instrument landings, Landing aids, Dipole antennas, Flight testing, Experimental data.

This report covers the field testing program for a DIRECTIONAL GLIDE SLOPE ANTENNA SYSTEM. The development of this system was described in SRDS Report No. RD-65-41. These tests were conducted at the following operational airports with problem site conditions: Kanawha County Airport, Charleston, West Virginia, and Greater Pittsburgh Airport, Corropolis, Pennsylvania. The tests were conducted by Federal Aviation Agency personnel after the equipment was installed at the site by ITT Federal Laboratories personnel, who also acted as observers during the flight tests. Included in this report are typical flight recordings as well as the glide slope characteristic curves resulting from the in-flight data. The analysis of this data establishes satisfactory Category I operation at both sites with probable Category II operation at the Charleston, West Virginia, site. (Author)

**PB-169 236** **Field 17G, 22C**
**CFSTI Prices: HC$3.00 MF$0.75**
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
**RADIO DOPPLER METHOD OF USING SATELLITES FOR GEODESY, NAVIGATION AND GEOPHYSICS WITHIN THE PLANETARY SYSTEM,**
by A. M. Stone and G. C. Weiffenbach. Jan 61, 84p TG-385
Contract NOrd-7386
AD 252 803

Descriptors: (*Satellite tracking systems, Doppler systems), (*Doppler systems, Satellite tracking systems), Satellites (Artificial), Geodesics, Navigational aids, Geophysics, Radio navigation.

Identifiers: Transit.

The report discusses the theory and operation of radio Doppler navigation and geodetic systems, illustrated by information and data derived from the US TRANSIT Navigational System.

## 48. NUCLEAR SCIENCE AND TECHNOLOGY

**ACNP-63580** **Field 18I**
**CFSTI Price: HC$1.00 MF$0.50**
Allis-Chalmers Mfg. Co., Washington, D. C. Nuclear Power Dept.
**LARGE FAST REACTOR DESIGN STUDY.**
Monthly rept.
Jul 63, 7p
Contract AT (11-1)-1316

Descriptors: (*Fast reactors, Reactor cores), (*Reactor materials, Reactor fuel elements).

**ACNP-65006** **Field 18J**
**CFSTI Prices: HC$4.00 MF$0.75**
Allis-Chalmers Mfg. Co., Bethesda, Md. Atomic Energy Div.
**ESH-4 TEST PROGRAM. REPORT ON FUEL ELEMENTS IRRADIATED IN THE E-SADE LOOP OF THE VALLECITOS BOILING WATER REACTOR,**
by E. A. Wick and D. A. Patterson. 1 Oct 65, 117p
Contract AT (11-1)-1123

Descriptors: (*Reactor fuel elements, Tests).

**AD-425 715** **Field 18N, 21C, 10B**
**CFSTI Price: HC$1.00**
Air Force Aero-Propulsion Lab., Wright-Patterson AFB, Ohio.
**AN ANALYSIS OF RADIOISOTOPE POWERED THRUSTORS FOR SPACE PROPULSION.**
Rept. for Jun 62-Apr 63,
by Robert F. Cooper and Richard L. Verga. Oct 63, 17p
Proj. AF-5350
ASD TDR-63-787,
N64 18047

Descriptors: (*Nuclear propulsion, Rocket motors), Radioactive isotopes, Design, Space propulsion, Radioactive decay, Electric propulsion, Heat, Thrust, Specific impulse, Radiation hazards, Mission profiles, Nuclear power plants, Heating, Hydrogen, Heat exchangers, Energy conversion, Ion engines.

Identifiers: SNAP 50.

A study is made of the utilization of radioactive isotopes in a hydrogen heat transfer rocket for space propulsion. The decay radiation from a radioisotope source would be used to heat an absorber. A propulsive fluid, or expellant, would in turn be heated by passing it over the hot absorber; the fluid would then be expelled through a nozzle to produce thrust. If the heating elements were maintained at temperatures of about 5000F, a device of this type could produce specific impulses up to 1000 seconds. Such a thrustor possesses inherent advantages over electrothermal propulsion devices of comparable thrust and specific impulse capabilities. Isotope-powered thrustors are conceptually simple, reliable, capable of long-operating lifetimes, and require no auxiliary source of electrical power. The specific weight of an isotope device may be nearly two orders of magnitude lower than that of comparable electrothermal engines coupled with SNAP-8 or SNAP-50 units. (Author)

**AD-430 130** **Field 18H, 9C**
**CFSTI Price: HC$2.00**
Sperry Microwave Electronics Co., Clearwater, Fla.
**STUDY OF PULSED RADIATION EFFECTS ON MICROWAVE FERRITE DUPLEXERS.**
Quarterly rept. no. 6, 1 Aug-31 Oct 63,
by J. A. Hart, Jr. and G. R. Harrison. Nov 63, 50p SJ-222-0041-6
Contract DA-36-039-SC-89113,
Task DA-OST-5974-01-004-36-00

Descriptors: (*Radar duplexers, Radiation damage), Nuclear particles, Waveguide circulators, Limiters, Ferrites, Coaxial cable, Waveguides, C-band, Klystrons, Gamma rays.

The report presents the results of the fourth series of radiation environmental experiments conducted during the sixth quarter of the program. Included in the report is a description of the equipment used to perform the experiments, the measurement techniques employed, and a complete dosimetry report. Photographs of important phases of the test are given to provide the reader with a better insight into the study. The high power tests, which were initiated during the fourth series of tests, are described and analyzed carefully. Conclusions are presented which are based upon the data taken thus far, including the fourth series of tests with high power operation. (Author)

**ANL-7106** **Field 18H, 11F, 18I, 18J, +**
**CFSTI Prices: HC$2.00 MF$0.50**
Argonne National Lab., Ill.
**FARET CORE I FUEL IRRADIATION PROGRAM AND REFERENCE DESIGN,**
by P. J. Persiani, T. S. Bump and W. J. Kann. Oct 65, 26p
Contract W-31-109-eng-58

Descriptors: (*Reactor fuel elements, Tests).

**BAW-3125-2** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
Babcock and Wilcox Co., Lynchburg, Va. Critical Experiment Lab.
**NONUNIFORM TEMPERATURE EFFECTS ON THORIUM RESONANCE ABSORPTION.**
Quarterly progress rept. no. 2, 1 Jul-30 Sep 64,
by W. G. Pettus and M. N. Baldwin. 30 Sep 64, 22p
Contract AT (30-1)-3125-2
EURAEC 1257

Descriptors: (*Thorium, Resonance absorption), (*Resonance absorption, Thorium).

**BAW-3125-3** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
Babcock and Wilcox Co., Lynchburg, Va. Critical experiment Lab.
**NONUNIFORM TEMPERATURE EFFECTS ON THORIUM RESONANCE ABSORPTION.**
Quarterly progress rept no. 3, 1 Oct-31 Dec 64,
by W. G. Pettus and M. N. Baldwin. 31 Dec 64, 17p
Contract AT (30-1)-3125
EURAEC 1328

Descriptors: (*Reactor materials, Thorium), (*Thorium, Resonance absorption).

**BAW-3125-4** **Field 18K**
**CFSTI Price: HC$3.00 MF$0.75**
Babcock and Wilcox Co., Lynchburg, Va. Critical Experiment Lab.
**NONUNIFORM TEMPERATURE EFFECTS ON THORIUM RESONANCE ABSORPTION.**
Final rept.,
by W. G. Pettus and M. N. Baldwin. Apr 65, 56p
EURAEC-1409
Contract AT (30-1)-3125

Descriptors: (*Thorium, Resonance absorption), (*Resonance absorption, Thorium).

**BNWL-4** **Field 18G, 7A**
**CFSTI Prices: HC$2.00 MF$0.50**
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
**RECOVERY OF STRONTIUM FROM STORED PUREX WASTE BY LEAD SULFATE CARRIER PRECIPITATION. PILOT PLANT STUDIES,**
by G. L. Richardson. 15 Jan 65, 32p
Contract AT (45-1)-1830

Descriptors: (*Strontium, Recovery), (*Radioactive waste, Separation).

**EURAEC-1121** **Field 18J**
**CFSTI Prices: HC$3.00 MF$0.75**
Nukelar-Chemie und-Metallurgie G.M.B.H., Wolfgang Bei Hanau Am Main. (Germany).
**PRODUCTION OF UO2 POWDERS FOR HIGH BULK DENSITY BY MELTING AND GRINDING AND THEIR PROCESSING INTO FUEL ELEMENTS.**
Quarterly rept. no. 16,
by W. Duerrschnabel, W. Hoppe, B. Liebmann, andL. Schikarski. 1964, 54p
Contract 013-63-7 TEED

Descriptors: (*Reactor fuel elements, Processing), (*Uranium compounds, Preparation).

**EURAEC-1164** **Field 18I**
**CFSTI Prices: HC$1.00 MF$0.50**
Technische Hogeschool, Eindhoven, (Netherlands).
**THE STEADY STATE AND DYNAMIC BEHAVIOUR OF A BOILING WATER REACTOR.**
Quarterly progress rept. 14, 1 Apr-1 Jul 64. 1964, 19p WW016-R71
Contract P-313

Descriptors: (*Boiling water reactors, Instrumentation).

**EURAEC-1239** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
Nuklear-Chemie und-Metallurgie G.M.B.H., Wolfgang Bei Hanneu Am Main. (Germany).
**PRODUCTION OF UO2 POWDERS OF HIGH BULK DENSITY BY MELTING AND GRINDING AND THEIR PROCESSING INTO FUEL ELEMENTS.**
Quarterly rept. no. 5, 1 Jul-30 Sep 64,
by W. Duerrschnabel, W. Hoppe, B. Liebmann, andL. Schirarski. 30 Sep 64, 20p
Contract 013-63-7 TEED

Descriptors: (*Reactor fuel elements, Processing), (*Uranium compounds, Preparation).

**EURAEC-1317** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
Nuklear-Chemie Und -Metallurgie G.M.B.H., Wolfgang Bei Hanau Am main (West Germany).
**PREPARATION OF UO2 POWDERS OF HIGH BULK DENSITY BY MELTING AND GRINDING AND THEIR PROCESSING INTO FUEL ELEMENTS.**
Quarterly rept. no. 6, 1 Oct-31 Dec 64,
by W. Duerrschnsbel, B. Liebmann,O. Neumann, and L. Schikerski. 31 Dec 64, 17p FUR-1800
Contract 013-63-7 TEED

Descriptors: (*Reactor fuel elements, Processing), (*Uranium compounds, Preparation).

**EURAEC-990** **Field 18J**
**CFSTI Prices: HC$2.00 MF$0.50**
Nuklear-Chemie und -Metellurgie G.M.B.H., Wolfgang Bei Hanau Main (West Germany).
**PREPARATION OF UO2 POWDERS OF HIGH BULK DENSITY BY MELTING AND GRINDING AND THEIR PROCESSING TO FUEL ELEMENTS.**
Quarterly rept. no. 14, 1 Oct-31 Dec 63.
31 Dec 63, 26p
Contract 013-63-7/TEED

Descriptors: (*Reactor fuel elements, Processing), (*Uranium compounds, Preparation).

**HW-79287** **Field 18I, 18J**
**CFSTI Prices: HC$3.00 MF$0.75**
General Electric Co., Richland, Wash. Hanford Atomic Products Operation.
**FUEL CONSERVATION INDEXES FOR THERMAL REACTORS,**
by E. A. Eschbach, M. F. Kanninen andW. I. Neef. Jul 64, 61p
Contract AT (45-1)-1350

Descriptors: (*Thermal reactors, Reactor fuels), (*Reactor fuels, Thermal reactors).

**IDO-14643** **Field 18J**
**CFSTI Prices: HC$3.00 MF$0.75**
Philips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
**DEVELOPMENT OF A CONTINUOUS ELECTROLYTIC PROCESS FOR RECOVERY OF URANIUM FROM HIGH-ENRICHED STAINLESS STEEL AND NICHROME FUELS,**
by W. B. Kerr, L. T. Lakey, and R. G. Denney. Oct 65, 65p
Contract AT (10-1)-205

Descriptors: (*Reactor fuel elements, Uranium), (*Uranium, Recovery).

**IITRI-T6042-11** **Field 18J**
**CFSTI Prices: HC$2.00 MF$0.50**
IIT Research Inst., Chicago, Ill.
**STUDIES OF REACTOR CONTAINMENT.**
Bimonthly progress rept. Jun-Jul 64,
by E. V. Gallagher. Jul 64, 30p
Contract AT (11-1)-578

Descriptors: (*Nuclear reactors, Containment), (*Reactor safety systems, Nuclear reactors).

**LA-3434** **Field 18A**
**CFSTI Prices: HC$3.00 MF$0.75**
Los Alamos Scientific Lab., Univ. of California, N. Mex.
**SEMIANNUAL STATUS REPORT OF THE LASL CONTROLLED THERMONUCLEAR RESEARCH PROGRAM FOR PERIOD ENDING OCTOBER 31, 1965.**
Nov 65, 91p
Contract W-7405-eng-36

Descriptors: (*Thermonuclear reactions, Plasma physics), (*Plasma physics, Thermo nuclear reactions).

**MLM-1283** **Field 18J**
**CFSTI Prices: HC$4.00 MF$0.50**
Mound Lab., Miamisburg, Ohio.
**REACTOR FUELS AND MATERIALS DEVELOPMENT PLUTONIUM RESEARCH APRIL-JUNE 1965,**
by L. J. Wittenberg and G. R. Grove. 10 Dec 65, 23p
Contract AT (33-1)-GEN-59

Descriptors: (*Reactor fuels, Plutonium alloys), (*Plutonium alloys, Ceramic materials).

**MMPP-FRPC-64-2** **Field 18K**
**CFSTI Prices: HC$3.00 MF$0.75**
Virginia. Univ., Charlottesville.
**MEASUREMENTS OF FAST NEUTRON CROSS SECTIONS,**
by Lawrence Crangerg. 1964, 75p
Contract AT (11-1)-1372
Presented at University of Michigan 8-12 Jun 1964.

Descriptors: (*Fast neutrons, Neutron cross sections), (*Neutron cross sections, Fast neutrons).

**MMPP-FRPC-64-3** **Field 18K**
**CFSTI Prices: HC$2.00 MF$0.50**
Massachusetts Inst. of Tech., Cambridge. Dept. of Nuclear Engineering.
**NONLINEAR REACTOR KINETICS,**
1964, 47p CONF-640615-2
Contract AT (11-1)-1372
Prepared for presentation at Fast Reactor Physics Conference, Ann Arbor, Mich. Gyftopoulos, Eliss P.

Descriptors: (*Fast reactors, Reactor kinetics), (*Reactor kinetics, Fast reactors).

**N65-17271** **Field 18N**
**CFSTI Prices: HC$4.00 MF$0.75**
Von Karman Center, Aerojet-General Corp., Azusa, Calif.
**SNAP-8 SEALS-TO-SPACE DEVELOPMENT TEST PROGRAM VOLUME II. MOLECULAR PUMP.**
Topical rept.,
by J. N. Hodgson. May 64, 112p Rept. no. AGC-2808 v2
Contract NAS5 417
NASA CR-54234

Descriptors: (*Seals (Stoppers), Auxiliary power plants), (*Nuclear power plants, Spacecraft).

**N65-17272** **Field 18N**
**CFSTI Prices: HC$3.00 MF$0.75**
Von Karman Center, Aerojet-General Corp., Azusa, Calif.
**SNAP-8 SEALS-TO-SPACE DEVELOPMENT TEST PROGRAM VOLUME III. DYNAMIC SLINGER,**
Topical rept.,
by R. L. Lessley and I. L. Marburger. May 64, 73p Rept. no. AGC-2800, v. 3
Contract NAS5 417
NASA CR-54234

Descriptors: (*Seals (Stoppers), Auxiliary power plants), (*Nuclear power plants, Spacecraft).

**N65-17273** **Field 18N, 11A**
**CFSTI Prices: HC$2.00 MF$0.50**
Von Karman Center, Aerojet-General Corp., Azusa, Calif.
**SNAP-8 SEALS-TO-SPACE DEVELOPMENT TEST PROGRAM VOLUME IV. INTEGRATED SEAL SIMULATOR.**
Topical rept.,
by R. L. Lessley, J. N. Hodgson, andE. A. Haglund. May 64, 45p Rept. no. AGC-2800 v4
Contract NAS5 417
NASA CR-54234

Descriptors: (*Seals (Stoppers), Auxiliary power plants), (*Nuclear power plants, Spacecraft).

**NAA-SR-11303** **Field 18I, 18K, 18N**
**CFSTI Prices: HC$1.00 MF$0.50**
Atomics International, Canoga Park, Calif.

**ARGON GENERATION IN NAK-COOLED REACTORS,**
by S. L. Rosen. 10 Nov 65, 13p
Contract AT-11-GEN-8

Descriptors: (*Argon, Liquid metal cooled reactors).

**NAA-SR-11450** **Field 18I, 18J, 18L**
**CFSTI Prices: HC$7.00 MF$2.00**
Atomics International, Canoga Park, Calif.
**ANNUAL TECHNICAL PROGRESS REPORT, AEC UNCLASSIFIED PROGRAMS, FISCAL YEAR 1965.**
10 Nov 65, 436p
Contract AT (11-1)-GEN-8

Descriptors: (*Nuclear reactors, Nuclear engineering), (*Nuclear engineering, Nuclear reactors).

**NAA-SR-9778** **Field 18N**
**CFSTI Prices: HC$3.00 MF$0.75**
Atomics International, Canoga Park, Calif.
**SNAP 10A, EXPANSION COMPENSATOR,**
by S. Sudar. 1 Oct 65, 72p
Contract AT-(11-1)-GEN-8

Descriptors: (*Auxiliary power plants, Nuclear reactors).

Identifiers: SNAP.

**NCSC-2981-1** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
North Carolina State Univ., Raleigh. Dept. of Engineering Research.
**A NUCLEAR FUEL CONSISTING OF VERY SMALL, UNIFORMLY DISPERSED UC PARTICLES IN A URANIUM MATRIX.**
Quarterly rept. for Aug 62,
by Robert F. Stoops and Anthony J. Mione. 1962, 15p
Contract AT (40-1)-2981
EURAEC 327

Descriptors: (*Reactor fuels, Particle size), (*Uranium compounds, Carbides).

**NCSC-2981-2** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
North Carolina State Univ., Raleigh. Dept. of Engineering Research.
**A NUCLEAR FUEL CONSISTING OF VERY SMALL, UNIFORMLY DISPERSED UC PARTICLES IN A URANIUM MATRIX.**
Quarterly rept. for Dec 62,
by Robert F. Stoops and Anthony J. Mion. 1962, 14p
Contract AT (40-1)-2981
EURAEC 334

Descriptors: (*Reactor fuels, Particle size), (*Uranium compounds, Carbides).

**NCSC-2981-3** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
North Carolina State Univ., Raleigh. Dept. of Engineering Research.
**A NUCLEAR FUEL CONSISTING OF VERY SMALL, UNIFORMLY DISPERSED UC PARTICLES IN A URANIUM MATRIX.**
Progress report for Feb 63,
by Robert F. Stoops and Anthony J. Mione. 1963, 13p.
Contract AT (40-1)-2981
EURAEC 669

Descriptors: (*Reactor fuels, Particle size), (*Uranium compounds, Carbides).

**NCSC-2981-5** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
North Carolina State Univ., Raleigh. Dept. of Engineering Research.
**A NUCLEAR FUEL CONSISTING OF VERY SMALL, UNIFORMLY DISPERSED UC PARTICLES IN A URANIUM MATRIX.**
Quarterly rept. for Sep 63,
by Robert F. Stoops. 1963, 21p
Contract AT (40-1)-2981
EURAEC 868

Descriptors: (*Reactor fuels, Particle size), (*Uranium compounds, Carbides).

**NCSC-2981-6** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
North Carolina State Univ., Raleigh. Dept. of Engineering Research.
**A NUCLEAR FUEL CONSISTING OF VERY SMALL, UNIFORMLY DISPERSED UC PARTICLES IN A URANIUM MATRIX.**
Quarterly rept. for Dec 63,
by Robert F. Stoops and Mitchell W. Haller. 1963, 19p
Contract AT (40-1)-2981
EURAEC 981

Descriptors: (*Reactor fuels, Particle size), (*Uranium compounds, Carbides).

**NCSC-2981-7** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
North Carolina State Univ., Raleigh. Dept. of Engineering Research.
**A NUCLEAR FUEL CONSISTING OF VERY SMALL, UNIFORMLY DISPERSED UC PARTICLES IN A URANIUM MATRIX.**
Quarterly rept. for Mar 64,
by Robert F. Stoops and Mitchell W. Haller. 1964, 21p
Contract AT (40-1)-2981
EURAEC 1054

Descriptors: (*Reactor fuels, Particle size), (*Uranium compounds, Carbides).

**NCSC-2981-8** **Field 18J**
**CFSTI Prices: HC$1.00 MF$0.50**
North Carolina State Univ., Raleigh. Dept. of Engineering Research.
**A NUCLEAR FUEL CONSISTING OF VERY SMALL, UNIFORMLY DISPERSED UC PARTICLES IN A URANIUM MATRIX.**
Quarterly rept. for Jun 64,
by Robert F. Stoops and Mitchell W. Haller. 1964, 23p
Contract AT (40-1)-2981
EURAEC 1155

Descriptors: (*Reactor fuels, Particle size), (*Uranium compounds, Carbides).

**ORNL-3765** **Field 18G**
**CFSTI Prices: HC$1.00 MF$0.50**
Oak Ridge National Lab., Tenn.
**RECOVERY OF 137 CS FROM FISSION-PRODUCT WASTES AND TRANSPORT BY AN ALUMINOSILICATE ION EXCHANGER,**
by R. E. Lewis, T. A. Butler and E. Lamb. May 65, 15p
Contract W-7405-eng-26

Descriptors: (*Cesium, Recovery), (*Radioactive waste, Cesium).

**ORNL-3843** **Field 18G, 6R, 18I**
**CFSTI Prices: HC$6.00 MF$1.00**
Oak Ridge National Lab., Tenn.
**NUCLEAR SAFETY PROGRAM SEMIANNUAL PROGRESS REPORT FOR PERIOD ENDING JUNE 30, 1965.**
Sep 65, 266p
Contract W-7405-eng-26

Descriptors: (*Safety, Nuclear engineering).

**ORNL-3861** **Field 18B, 7A**
**CFSTI Prices: HC$3.00 MF$0.50**
Oak Ridge National Lab., Tenn.
**REVIEW OF ORNL ELECTROMAGNETIC SEPARATIONS PROGRAM,**
by L. O. Love and W. A. Bell. Nov 65, 47p
Contract W-7405-eng-26

Descriptors: (*Isotope separation, Electromagnetic fields).

**PB-169 141** **Field 18B, 8D**
**CFSTI Prices: HC$1.00 MF$0.50**
Massachusetts Inst. of Tech., Cambridge. Dept. of Geology and Geophysics.
**PREPARATION OF HIGH SPECIFIC ACTIVITY Sn125 RADIOTRACER,**
by John W. Winchester. 1960, 3p

Descriptors: (*Tin, Radioactive isotopes), (*Radioactive isotopes, Preparation), Geochemistry, Tracer studies, Fission products, Purification, Netherlands.

A description is given of the preparation of tin-125 (suitable for use as a geochemical tracer) by the purification of fission products of cyclotron-particle bombarded thorium or uranium.

**PB-169 164** **Field 18B**
**CFSTI Prices: HC$2.00 MF$0.50**
Commissariat a l'Energie Atomique, Fontenay-sayaux-Roses (France). Centre d'Etudes Nucleaires.
**ETUDE PRELIMINAIRE A LA PREPARATION D'URANIUM 232 PAR IRRADIATION DE PROTACTINIUM 231 (PRELIMINARY STUDY OF THE PREPARATION OF URANIUM 232 BY IRRADIATION OF PROTACTINIUM 231),**
by Philippe Guillot. Dec 65, 36p CEA-R-2917
Text in French; Attached Summary in English.

Descriptors: (*Isotope separation, Uranium), Protractinium, Tracer studies, Alpha decay, Bibliographies, France.

A bibliography about preparation of uranium 232 is done. This even-even isotope of uranium is suitable for radio-active tracer, neutron source through alpha, n reaction and heat source applications. The irradiation of protactinium 231, the chemical separation and the purification of uranium are studied. (Author)

**RFP-548** **Field 18D, 11F**
**CFSTI Prices: HC$1.00 MF$0.50**
Rocky Flats Div., Dow Chemical Co., Golden, Colo.
**A METALLOGRAPHIC HOT-STAGE FOR PLUTONIUM,**
by R. L. Greason, W. L. Johns, and R. J. Jackson. 22 Oct 65, 14p
Contract AT (29-1)-1106

Descriptors: (*Plutonium, Microstructure), (*Metallography, Plutonium).

**TID-21407** **Field 18E**
**CFSTI Prices: HC$2.00 MF$0.75**
Kernkraftwerk RWE-Bayernwerk G.M.B.H., Gundremmingen. (Germany).
**237 MW KRB NUCLEAR POWER PLANT.**
Quarterly rept.
1964, 63p
EUR C/4630/64E

Descriptors: (*Nuclear power plants, Construction).

**TID-21501** **Field 18E**
**CFSTI Prices: HC$4.00 MF$0.75**
Kernkraftwerk RWE-Bavernwerk G.M.B.H., Gundremmingen, (West Germany).
**237 MW KRB NUCLEAR POWER PLANT.**
Quarterly rept. no. 6, 1 Jul-30 Sep 64.
1964, 124p
EUR C/318/65C

Descriptors: (*Nuclear power plants, Construction).

**TID-21547** **Field 18D**
**CFSTI Prices: HC$1.00 MF$0.50**
Phylatron Corp., Columbus, Ohio.
**DEVELOPMENT OF A HIGH-SENSITIVITY FAST NEUTRON DOSIMETER.**
Quarterly rept. no. 7, 1 Nov 64-31 Jan 65,
by B. H. Chase, R. R. F. Speers, J. M. Swartz, andM. O. Thurston. 31 Jan 65, 5p
Contract AT (11-1)-1226

Descriptors: (*Fast neutrons, Dosimeters), (*Dosimeters, Sensitivity).

**TID-21593** **Field 18E**
**CFSTI Prices: HC$4.00 MF$0.75**
Kernkraftwerk Rwe-Bayernwerk G.M.B.H., Gundremmingen (Germany).
**237 MW KRB NUCLEAR POWER PLANT.**
Quarterly rept. no. 5, 1 Apr-30 Jun 64.
1964, 120p KRB-1964/2
EUR c/5494/64E

Descriptors: (*Nuclear power plants, Construction), (*Nuclear reactors, Containment).

**TID-21786** **Field 18G**
**CFSTI Prices: HC$3.00 MF$0.75**
Division of International Affairs (AEC), Washington, D. C.
**AN ECONOMIC STUDY OF THE C.E.N. RADIOACTIVE WASTE TREATMENT PLANT,**
1965, 68p
Contract AT (30-1)-3348

Descriptors: (*Radioactive waste, Disposal).

**TID-3515** **Field 18B, 6P**
**CFSTI Prices: HC$6.00 MF$1.50**
Division of Technical Information Extension (AEC). Oak Ridge, Tenn.
**PHYSIOLOGICAL STUDIES EMPLOYING RADIOISOTOPES,**
by Helen L. Ward. May 65, 284p

Descriptors: (*Physiology, Radioactive isotopes), (*Radioactive isotopes, Physiology).

**TID-3525** **Field 18I**
**CFSTI Prices: HC$3.00 MF$0.75**
Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
**REACTOR SAFETY. A LITERATURE SEARCH,**
by Richard J. Smith. Aug 65, 70p

Descriptors: (*Bibliographies, Reactor safety systems), (*Reactor safety systems, Bibliographies).

**UCRL-13104** **Field 18C, 8I**
**CFSTI Prices: HC$3.00 MF$0.75**
Anaconda Co., Butte, Mont.
**NUCLEAR MINING FEASIBILITY STUDY.**
Final rept.
1965, 72p
Contract W-7405-eng-48

Descriptors: (*Nuclear explosions, Mining engineering), (*Mining engineering, Nuclear explosions).

**WASH-1061** **Field 18H, 6R**
**CFSTI Prices: HC$4.00 MF$1.00**
Division of Biology and Medicine (AEC). Washington, D. C. Fallout studies branch.
**NATURAL ENVIRONMENTAL RADIOACTIVITY. AN ANNOTATED BIBLIOGRAPHY,**
by Alfred W. Kiement, Jr. Jul 65, 129p

Descriptors: (*Natural radioactivity, Bibliographies), (*Bibliographies, Natural radioactivity).

**Y-1489** **Field 18D, 20F**
**CFSTI Prices: HC$2.00 MF$0.50**
Union Carbide Corp., Oak Ridge, Tenn. Y-12 Plant.
**PRINCIPLES AND OPERATION OF THE ALIGNMENT INTERFEROMETER,**
by B. R. Baldwin and L. G. Whitten. 14 Jul 65, 33p
Contract W-7408-eng-26

Descriptors: (*Interferometers, Alignment), (*Optical equipment, Interferometers).

## 19. ORDNANCE

**AD-467 335** **Field 19A**
**CFSTI Prices: HC$3.00 MF$0.75**
Feltman Research Labs., Picatinny Arsenal, Dover, N. J.
**SMOKE MARKER DETECTION AND IDENTIFICATION STUDY.**
Technical rept.,
by M. Harold Weasner and Jack Carlock. Aug 65, 60p
Proj. DA-1X132401D050
PA TR-3259

Descriptors: (*Colored smokes, Detection), (*Markers, Colored smokes), Tests, Identification, Colors, Volume, Aerial reconnaissance, Targets, Surface targets, Human engineering, Time, Test methods, Smoke munitions, Grenades.

A field study was conducted to determine the minimum volume and duration of colored smokes that could be detected, identified, and located by both ground and aerial observers. The distances from observers to smoke emission sites varied from approximately 500 to 10,000 meters. Red, yellow, green, violet, and white smokes were generated by initiating U. S. Army standard M8 and M18 smoke grenades. Nine volume-duration combinations of smoke were tested. Volume of smoke was controlled by initiating various numbers of grenades (one, two, or three) simultaneously. Duration of smoke emission was controlled by initiating various numbers of grenades in succession so as to give a continuous smoke. The larger volume-duration combinations (e.g.,2-2 and 3-3) yielded the highest rates of detection, color identification, and correct location of smoke emission sites. Observers located between 500 and 6000 meters from the smoke had higher rates of detection, identification, and location than did observers located at distances greater than 6000 meters. In terms of overall effectiveness, the best volume-duration combination is 2-3. White smoke yielded the highest rates of correct detection, correct identification, and correct location. Red was the next best color, while violet was the poorest. (Author)

**N66-13233** **Field 19D, 19G**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**AN APPROXIMATE METHOD FOR SOLVING THE SINGLE-DEGREE-OF-FREEDOM ROLL EQUATION WITH TIME-DEPENDENT COEFFICIENTS.**
Technical note,
by C. William Martz. Dec 65, 21p NA-SA-TN-D-3158

Descriptors: (*Roll, Rocket trajectories), (*Spin stabilization, Rockets).

Identifiers: Trailblazer.

**Patent 3,221,603** **Field 19F**
**CARTRIDGE FEEDING MECHANISM FOR FIXEDBARREL, SLIDE-OPERATED GUNS.**
Patent assigned to Army,
by John L. Lochhead. 7 Dec 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Guns, Automatic weapons), (*Feed mechanisms, Breech mechanisms), (*Breech mechanisms, Feed mechanisms), Gun barrels, Cartridge case extractors), Patents.

The automatic gun is for use on aircraft and tanks. The cartridge feeding mechanism is for a large caliber automatic gun of the type wherein the bolt is actuated by a reciprocating slide to strip the leading cartridge from a linked belt. An arrangement is provided for converting the longitudinal reciprocation of the slide to a transverse reciprocation of the feed mechanism.

**Patent 3,221,693** **Field 19H, 17A**
**TARGET ANGLE DISCRIMINATOR FOR DIRECTIONALLY SENSITIVE WAVE ENERGY RECEIVERS.**
Patent assigned to Navy,
by Paul C. Gardiner. 7 Dec 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Acoustic torpedoes, Target discrimination), (*Target discrimination, Acoustic torpedoes), Target angle, Underwater sound, Electroacoustic transducers, Transmitter-receivers, Patents.

The target angle discriminator is for the electroacoustic receiver of an echo controlled torpedo. Circuits are provided which are adapted to artificially cause the echo receiver to disregard echoes returning from undesirable angles whether the signals are from the ocean bottom or from an actual target.

**Patent 3,221,694** **Field 19H**
**TIME DELAY CIRCUITS FOR ECHO CONTROLLED STEERING GEAR.**
Patent assigned to Navy,
by Robert S. Gardner. 7 Dec 65
Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Acoustic torpedoes, Delay circuits), (*Delay circuits, Acoustic torpedoes), Steering, Timing circuits, Transmitter-receivers, Control systems, Automatic, Patents, Marine rudders.

The automatic steering system is for a torpedo. The system includes a transmitter, a receiver and a rudder. The off-on steering gear is provided with elements adapted to reverse the rudder position upon the expiration of a measured time interval following the last of a series of received echo signals.

**PB-169 224** **Field 19B**
**CFSTI Prices: HC$4.00 MF$1.00**
Weapons Research Establishment, Salisbury (South Australia).
**RESULTS AND CONCLUSIONS OF THE JOINT R.A.E/W.R.E. RESEARCH PROGRAMME ON THE FLIGHT DYNAMICS AND BALLISTIC CONSISTENCY OF FREELY FALLING CRUCIFORM FINS,**

by C. W. Rhodes and J. H. W. Shannon. Nov 65, 135p Rept. no. HSA-20

Descriptors: (*Bombs, Ballistics), (*Ballistics, Bombs), (*Free fall missiles, Ballistics), Fin-stabilized ammunition, Free flight trajectories, Wind tunnels, Aerodynamic characteristics, Ordnance laboratories, Australia.

A general investigation of the stability problems of freely falling missiles has been made. This report presents results of a joint R.A.E./W.R.E. research programme which was initiated in 1960 and incorporated a series of free flight trails of full scale instrumented test vehicles, wind tunnel tests carried out over wide range of Reynolds numbers and mathematical model studies using a fast digital computer. Correlations between predicted motions of the vehicle and behaviour actually observed in the trials confirmed both the formulation of the mathematical model and the validity of wind tunnel measurements. The results have provided considerable insight into problems associated with the release disturbance and stability requirements needed for good ballistic consistency. Finally, suggestions are made for the aerodynamic design of fin stabilized bombs. (Author)

## 20. PHYSICS

**AD-407 604** **Field 20C, 20J, 12A**
**CFSTI Price: HC$1.00**
Lincoln Lab., Mass. Inst. of Tech., Lexington.
**A FOURIER THEOREM AND ITS APPLICATION TO THE MEASUREMENT OF ELECTROMAGNETIC FIELDS AND QUANTUM MECHANICAL STATES.**
Technical rept.,
by H. E. Moses and J. S. Lomont. 30 Apr 63, 9p TR-310
Contract AF19 (628)-500; ARPA Order-13,
Proj. DEFENDER
N63 22941
Prepared in cooperation with Polytechnic Inst. of Brooklyn, N. Y.

Descriptors: (*Electromagnetic fields, Measurement), (*Quantum mechanics, Measurement), (*Fourier analysis, Electromagnetic fields), Electromagnetic waves, Transformations (Mathematics), Theory, Integral transforms, Integrals, Functions, Differential equations, Density, Probability, Polynomials, Topology, Operators (Mathematics), Energy.

A mathematical theorem is presented by which one can determine in an essentially unique way a complex function of a real argument from its absolute value and the absolute values of the Fourier transform of the truncated function for all possible truncations. The absolute values of the function and of the Fourier transforms have a physical significance in electromagnetic and quantum theory. The theorem presented enables one to assign electric fields to energy densities and quantum mechanical states to sets of probability densities. The measurements required for use in quantum mechanics can be expressed as the mean values of certain operators constructed from the position and momentum operators. (Author)

**AD-451 653** **Field 20N**
**CFSTI Price: HC$1.00**
Navy Electronics Lab., San Diego, Calif.
**RADIO REFRACTION BY THE MARINE LAYER AND ITS EFFECT ON MICROWAVE PROPAGATION.**
Research rept.,
by E. E. Gossard. 21 Sep 64, 13p NEL-1240
Proj. SR-008-01-01,
Task 7031 (NEL-M10351)

Descriptors: (*Microwaves, Propagation), (*Radio transmissions, Atmospheric refraction), (*Atmospheric refraction, Microwaves), Marine meteorology.

This report discusses the microwave propagation phenomena that exist at the air-sea interface due to the large gradients of temperature and humidity near the sea surface. The report consists of a reproduction of a paper presented by invitation at the 1964 National Telemetering Conference at Los Angeles, California, and published in the proceedings of that meeting. (Author)

**AD-467 351** **Field 20A, 8A**
**CFSTI Prices: HC$2.00 MF$0.50**
Navy Electronics Lab., San Diego, Calif.
**MARINE BIOLOGICAL SOUND WEST OF SAN CLEMENTE ISLAND. DIURNAL DISTRIBUTIONS AND EFFECTS ON AMBIENT NOISE LEVEL DURING JULY 1963.**
Research rept.,
by P. O. Thompson. 24 May 65, 45p NEL-1290
Proj. SF-001-03-16,
Task 8529

Descriptors: (*Marine biological noise, Pacific Ocean), (*Pacific Ocean, Marine biological noise), Oceanology, Underwater sound, Recording systems.

Identifiers: San Clemente Island.

A survey was made of the biological sound present in a set of tape recordings obtained from a hydrophone at 60 fathoms and another at 450 fathoms, over an 8-day period. A variety of types of biological sound were distinguished and analyzed. They were shown to have significant influence on the ambient noise level. (Author)

**CONF-471-45** **Field 20I**
**CFSTI Prices: HC$1.00 MF$0.50**
Research Lab. of Electronics. Massachusetts Inst. of Tech.
**HIGH-PERVEANCE ELECTRON BEAM-PLASMA INTERACTION REPORT ON AN EXPERIMENT IN THE LONG SOLENOID FACILITY AT OAK RIDGE NATIONAL LABORATORY,**
by W. D. Getty. 16 Dec 63, 25p
Contract W-7405-eng-26
Prepared for presentation at American Physical Society 5th Annual Meeting, San Diego, Calif., Nov. 1963.

Descriptors: (*Plasma physics, Electron beams), (*Electron beams, Plasma physics).

**COO-1198-228** **Field 20C**
**CFSTI Prices: HC$3.00 MF$0.75**
Illinois Univ., Urbana.
**A MAGNETIC RESONANCE STUDY OF IRON IN SILVER CHLORIDE.**
Doctoral thesis,
by John Campbell Garth. Nov 64, 65p
Contract AT (11-1)-1198

Descriptors: (*Silver compounds, Chlorides), (*Iron, Magnetic resonance).

**COO-1198-255** **Field 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
Illinois Univ., Urbana.
**ADVANCES IN MOSSBAUER EFFECT METHODOLOGY HIGH PRESSURE TECHNIQUES,**
by R. Ingalls. 1964, 12p
Contracts AT (11-1)-1198, Nonr-1834 (05)

Descriptors: (*High-pressure research, Mossbauer effect), (*Mossbauer effect, High-pressure research).

**EURAEC-1314** **Field 20L**
**CFSTI Prices: HC$1.00 MF$0.50**
Hahn-Meitner-Institut for Kernforschung, Berlin (West Germany).
**DIFFUSION OF RARE GASES IN SOLIDS.**
Quarterly rept. no. 18, Oct-Dec 64.
Jan 65, 23p EU-B37
Contract 028-64-1 TEE (RD)

Descriptors: (*Helium group gases, Diffusion), (*Solids, Helium group gases).

**EURAEC-772** **Field 20L**
**CFSTI Prices: HC$2.00 MF$0.50**
Hahn-Meitner-Institut fur Kernforschung Berlin (West Germany).
**THE KINETICS OF RARE-GAS DIFFUSION IN SOLIDS. TABLES AND GRAPHS FOR THE EVALUATION OF POST-ACTIVATION DIFFUSION EXPERIMENTS. (RARE-GAS DIFFUSION IN SOLIDS 10),**
by T. Lagerwall and K. E. Zimen. 1964, 36p EUR-1372.E
Contract 064-61-8-RDD

Descriptors: (*Helium group gases, Diffusion), (*Solids, Helium group gases).

**IDO-17115** **Field 20H**
**CFSTI Prices: HC$3.00 MF$0.75**
Phillips Petroleum Co. Idaho Falls, Idaho. Atomic Energy Div.
**LIMITED-ENERGY NEUTRON SOURCES PRODUCED BY THE DECAY OF EXCITED NUCLEI.**
Thesis,
by E. A. King. Sep 65, 61p
Contract AT (10-1)-205

Descriptors: (*Neutrons, Sources).

**IITRI-1184-15** **Field 20C**
**CFSTI Prices: HC$2.00 MF$0.50**
IIT Research Inst., Chicago, Ill.
**MAGNETIC PROPERTIES OF INSULATORS.**
Quarterly rept no. 15, 16 Aug-15 Nov 64,
by J. J. Markham. 5 Dec 64, 44p
Contract AT (11-1)-587

Descriptors: (*Electric insulation, Magnetic properties).

**IS-1107** **Field 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
Ames Lab., Iowa State State Univ. of Science and Tech.
**LOCALIZED SELF-CONSISTENT FIELD ORBITALS IN ATOMS AND MOLECULES,**
by Klaus Ruedenberg. 23 Feb 65, 22p CONF-650208-1
Contract W-7405-eng-82
Prepared for presentation at International Symposium for Quantum Chemistry, Istanbul.

Descriptors: (*Molecular orbitals, Hartree-Fock approximation), (*Hartree-Fock approximation, Molecular orbitals).

**LA-3381** **Field 20M, 9B**
**CFSTI Prices: HC$2.00 MF$0.50**
Los Alamos Scientific Lab., Univ. of California, N. Mex.
**FORTRAN IV HYDROGEN PROPERTY TABULAR CODES,**
by O. A. Farmer, T. E. Springer, andB. B. Fisher. 15 Sep 65, 27p
Contract W-7405-eng-36

Descriptors: (*Hydrogen, Physical properties), Programming (Computers).

**LA-3405** **Field 20M**
**CFSTI Prices: HC$2.00 MF$0.50**
Los Alamos Scientific Lab., Univ. of California, N. Mex.
**THERMODYNAMIC-TRANSPORT AND RELATED PROPERTIES OF PARA-HYDROGEN**

**FROM 36 TO 5000 DEG R AT PRESSURES TO 5000 PSIA,**
by Otis A. Farmer. 1 Oct 65, 34p
Contract W-7405-eng-36

Descriptors: (*Hydrogen, Physical properties).

**LA-3419** **Field 20G, 20H**
**CFSTI Prices: HC$3.00 MF$0.50**
Los Alamos Scientific Lab., Univ. of California, N. Mex.
**QUARTERLY STATUS REPORT ON THE MEDIUM-ENERGY PHYSICS PROGRAM FOR PERIOD ENDING SEPTEMBER 30, 1965.**
Oct 65, 75p
Contract W-7405-eng-36

Descriptors: (*Proton accelerators, Linear accelerators), (*Measons, Scientific research).

**MRC-489-Pts-1-2** **Field 20L**
**CFSTI Prices: HC$3.00 MF$0.75**
Materials Research Corp., Orangeburg, N. Y.
**IRON SINGLE CRYSTAL PREPARATION. PART I. THE PREPARATION OF THE CRYSTALS AND A STUDY OF THEIR MECHANICAL AND ELECTRICAL PROPERTIES AT LOW TEMPERATURES. PART II. SOME EXPERIMENTS ON THE USE OF THE ELECTROTRANSPORT PHENOMENON FOR THE FURTHER PURIFICATION OF ELECTRON BEAM ZONE-REFIN.**
Final rept. 2 Apr 63-1 Apr 64,
by E. J. Hughes, P. W. Barton, and R. D. Vigue.
19 Apr 64, 64p
Contract AT (30-1)-2980

Descriptors: (*Iron, Single crystals), (*Crystals, Tensile properties).

**N65-17280** **Field 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
Denver Univ., Colo.
**EFFECTS OF ION BEAM EXCITATION ON CHARGE TRANSFER CROSS SECTION MEASUREMENTS,**
by Robert C. Amme and Nyle G. Utterback. Jul 63, 15p
Grant NsG50 60
NASA CR-60779
Presented at the International Conference on the Physics of Electronic and Atomic Collections, (3rd).

Descriptors: (*Ion beams, Excitation), (*Ion sources, Ion beams).

**N65-18488** **Field 20F, 3B**
**CFSTI Prices: HC$3.00 MF$0.50**
CBS Labs., Stamford, Conn. Electron Tube Dept.
**1-1/2 INCH ELECTROSTATIC IMAGE DISSECTOR.**
Final rept. for 24 Jan 61-30 Apr 64,
by Charles E. Misso. 27 Aug 64, 54p
Contracts NAS7 100, JPL950054
NASA CR-57053

Descriptors: (*Optical images, Image tubes), (*Stars trackers, Optical images).

**N65-31137** **Field 20N**
**CFSTI Prices: HC$2.00 MF$0.50**
Alabama Univ., Huntsville. Research Inst.
**APPROXIMATE METHODS FOR THE COMPUTATION OF WAVE PROPAGATION IN NONUNIFORM MEDIA,**
by H. H. Yee. Aug 65, 33p
Grant NsG-608
NASA CR-283

Descriptors: (*Approximation (Mathematics), Propagation), (*Electromagnetic waves, Propagation).

**N65-34243** **Field 20M**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**CHARTS OF ISENTROPIC EXPONENT AS A FUNCTION OF ENTHALPY FOR VARIOUS GASES IN EQUILIBRIUM,**
by Leland H. Jorgensen. 1965, 13p NASA-SP-3020

Descriptors: (*Enthalpy, Gases).

**N65-35830** **Field 20F, 7D**
**CFSTI Prices: HC$6.00 MF$1.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**ABSORPTION TABLES FOR ELECTRON PROBE MICROANALYSIS,**
by I. Adler and J. Goldstein. Oct 65, 275p
NASA-TN-D-2984

Descriptors: (*Absorption, Tables).

**N65-35839** **Field 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**ELASTIC AND INELASTIC SCATTERING OF 40-MeV ALPHA PARTICLES FROM EVEN TIN ISOTOPES,**
by Norton Baron, Regis F. Leonard, John L. Need and William M. Stewart. Oct 65, 45p NASA-TN-D-3067

Descriptors: (*Alpha particles, Scattering).

**N65-35950** **Field 20K**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**MEMBRANE ANALYSIS OF PRESSURIZED THIN SPHEROID SHELLS COMPOSED OF FLAT GORES, AND ITS APPLICATION TO ECHO II,**
by Hossein Bahiman. Oct 65, 13p NASA-TN-D-3002

Descriptors: (*Membranes, Analysis).

**N65-35954** **Field 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**EQUATION OF STATE OF MATTER AT SUPERNUCLEAR DENSITY,**
by E. R. Harrison. Oct 65, 8p NASA-TN-D-3020

Descriptors: (*Equations of state, Nuclear particles).

**N65-35961** **Field 20I**
**CFSTI Prices: HC$1.00 MF$0.50**
Rensselaer Polytechnic Inst., Troy, N. Y.
**A MICROWAVE LENS SYSTEM FOR PLASMA DIAGNOSTICS,**
by R. A. Bitzer and E. H. Holt. Oct 65, 14p
Grant NsG-48
NASA CR-319

Descriptors: (*Probes (Electromagnetic), Lenses), (*Lenses, Microwave frequency).

Identifiers: Diagnosis (Plasma physics).

**N65-35963** **Field 20D**
**CFSTI Prices: HC$1.00 MF$0.50**
Catholic Univ. of America, Washington, D. C.
**ON THE ESTABLISHMENT OF DENSITY PROFILE FOR THE FLOW OF A TWO-FLUID SINGLE PHASE GAS MIXTURE,**
by Timothy W. Kao. Oct 65, 22p
Grant NsG-586
NASA CR-330

Descriptors: (*Gas flow, Density).

**N65-36774** **Field 20K, 13M**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**DAMPING CHARACTERISTICS OF BUILT-UP CANTILEVER BEAMS IN A VACUUM ENVIRONMENT,**
by Robert R. McWithey and Robert J. Hayduk.
Nov 65, 34p NASA-TN-D-3065

Descriptors: (*Cantilever beams, Damping).

**N66-10326** **Field 20I**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**A SINGLE-COLLISION MODEL FOR ELECTRON-BEAM CURRENTS BETWEEN PLANE ELECTRODES.**
Technical note,
by Charles M. Goldstein and Arthur W. Goldstein.
Nov 65, 21p NASA-TN-D-3058

Descriptors: (*Electron beams, Electrodes).

**N66-10667** **Field 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**OPTIMUM TARGET ORIENTATION IN NUCLEAR REACTION EXPERIMENTS.**
Technical note,
by John L. Need. Nov 65, 24p NASA-TN-D-3116

Descriptors: (*Charged particles, Particle trajectories), (*Nuclear reactions, Charged particles).

**N66-10714** **Field 20D**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**LOCAL TURBULENT HEAT TRANSFER FOR WATER IN ENTRANCE REGIONS OF TUBES WITH VARIOUS UNHEATED STARTING LENGTHS.**
Technical note,
by James R. Stone. Nov 65, 22p NASA-TN-D-3098

Descriptors: (*Heat transfer, Fluid flow), (*Fluid flow, Turbulence).

**N66-12159** **Field 20H**
**CFSTI Prices: HC$3.00 MF$0.75**
LTV Vought Aeronautics Div., Ling-Temco-Vought, Inc., Dallas, Tex.
**INVESTIGATIONS OF ELECTRON INTERACTIONS WITH MATTER. PART I. BREMSSTRAHLUNG PRODUCTION IN ALUMINUM AND IRON. PART II. ELECTRON SCATTERING IN ALUMINUM.**
Contractor rept.,
by William E. Dance, Leo L. Baggerly, David H. Rester, and Walter J. Rainwater, Jr. Dec 65, 90p
Contract NASw-948
NASA CR-334

Descriptors: (*Bremsstrahlung, Aluminum), (*Electrons, Scattering), Iron.

**N66-12254** **Field 20M, 12A**
**CFSTI Prices: HC$1.00 MF$0.50**
Case Inst. of Tech., Cleveland, Ohio.
**THE RADIAL HEAT EQUATION AND LAPLACE TRANSFORMS.**
Contractor rept.,
by Louis R. Bragg. Dec 65, 10p
Grant NsG-544
NASA CR-337

Descriptors: (*Thermodynamics, Partial differential equations), (*Integral transforms, Partial differential equations).

**N66-12256** **Field 20M**
**CFSTI Prices: HC$2.00 MF$0.50**
ManLabs, Inc., Cambridge, Mass.
**ANALYSES OF VAPORIZATION IN LIQUID URANIUM BEARING SYSTEMS AT VERY HIGH TEMPERATURES.**
Contractor rept.,
by L. Kaufman and E. T. Peters. Dec 65, 28p
Contract NAS3-7168
NASA CR-353

Descriptors: (*Liquid metals, Heat of vaporization), (*Heat of vaporization, Uranium).

**N66-12529** **Field 20I**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**ROLE OF CONDUCTIVITY IN HYDROMAGNETIC STABILITY OF PARALLEL FLOWS,**
Technical note,
by Philip R. Nachtsheim and Eli Reshotko. Dec 65, 23p NASA-TN-D-3144
Prepared in cooperation with Case Inst. of Tech., Cleveland, Ohio.

Descriptors: (*Magnetohydrodynamics, Stability), (*Laminar flow, Electrical conductance).

**N66-12532** **Field 20I**
**CFSTI Prices: HC$1.00 MF$0.50**
General Atomic, San Diego, Calif.
**CYCLOTRON WAVES IN A COLLISIONLESS PLASMA.**
Contractor rept.,
by C. B. Wharton and J. H. Malmberg. Dec 65, 12p
Contract NAS7-275
NASA CR-348

Descriptors: (*Cyclotron waves, Plasma medium), (*Plasma medium, Cyclotron waves).

**N66-13016** **Field 20I, 20H**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**VOLUME AND SURFACE INSTABILITY IN SLIDING PLASMAS.**
Technical note,
by S. P. Talwar. Dec 65, 16p NASA-TN-D-3051

Descriptors: (*Charged particles, Plasma physics), (*Plasma medium, Stability).

**N66-13021** **Field 20K**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**TEST OF A TRUSS-CORE SANDWICH CYLINDER LOADED TO FAILURE IN BENDING.**
Technical note,
by James P. Peterson and James Kent Anderson. Dec 65, 28p NASA-TN-D-3157

Descriptors: (*Cylindrical bodies, Loading (Mechanics)), (*Failure (Mechanics), Bending).

**N66-13022** **Field 20H, 18A**
**CFSTI Prices: HC$3.00 MF$0.75**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**NONADIABATIC PARTICLE LOSSES IN AXISYMMETRIC AND MULTIPOLAR MAGNETIC FIELDS.**
Technical note,
by J. Reece Roth. Dec 65, 73p NASA-TN-D-3164

Descriptors: (*Magnetic fields, Charged particles), (*Particle trajectories, Plasma physics).

**N66-13024** **Field 20K**
**CFSTI Prices: HC$3.00 MF$0.75**
National Aeronautics and Space Administration, Langely Station, Va. Langley Research Center.
**A THEORETICAL AND EXPERIMENTAL STUDY OF THE NONLINEAR FLEXURAL VIBRATIONS OF THIN CIRCULAR RINGS.**
Technical rept.,
by David A. Evensen. Dec 65, 58p NASA-TR-R-227

Descriptors: (*Rings, Vibration), (*Vibration, Nonlinear differential equations).

**N66-13046** **Field 20C**
**CFSTI Prices: HC$1.00 MF$1.00**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**MAGNETIC FIELDS DUE TO SOLID AND HOLLOW CONICAL CONDUCTORS,**
by James C. Stoll, Peggy L. Yohner andJames C. Laurence. 1965, 131p NASA-SP-3022

Descriptors: (*Magnetic fields, Conical bodies), (*Electromagnets, Conductivity).

**N66-13226** **Field 20H, 4A**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
**AN INVESTIGATION OF THE INTENSITIES AND CHARGE COMPOSITION OF LOW ENERGY ELECTRONS AT BALLOON ALTITUDES.**
Technical note,
by Peter Serlemitsos. Dec 65, 20p NASA-TN-D-3108

Descriptors: (*Cosmic rays, Electrons), (*Balloons, High altitude).

**N66-13232** **Field 20D**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
**PRESSURE FLUCTUATIONS IN TURBULENT BOUNDARY LAYERS.**
Technical note,
by M. V. Lowson. Dec 65, 25p NASA-TN-D-3156

Descriptors: (*Turbulent boundary layer, Pressure), (*Aerodynamics, Turbulent boundary layer).

**N66-13234** **Field 20G**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**ATOMIC BEAM DETERMINATION OF THE CESIUM-CESIUM TOTAL SCATTERING CROSS SECTION.**
Technical note,
by John W. Sheldon and Eugene J. Manista. Dec 65, 31p NASA-TN-D-3160

Descriptors: (*Molecular beams, Cesium), (*Cesium, Potential scattering).

**N66-13236** **Field 20D**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**DRAG CHARACTERISTICS OF A SERIES OF LOW-DRAG BODIES OF REVOLUTION AT MACH NUMBERS FROM 0.6 TO 4.0.**
Technical note,
by Roy V. Harris, Jr. and Emma Jean Landrum. Dec 65, 30p NASA-TN-D-3163

Descriptors: (*Drag, Bodies of revolution), (*Skin friction, Reynolds number).

**N66-13237** **Field 20D**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
**LIQUID CAVITATION STUDIES IN CIRCULAR PIPE BENDS.**
Technical note,
by R. E. Stonemetz. Dec 65, 19p NASA-TN-D-3176

Descriptors: (*Pipe bends, Cavitation), (*Cavitation, Liquids).

**N66-13241** **Field 20A**
**CFSTI Prices: HC$3.00 MF$0.50**
Massachusetts Inst. of Tech., Cambridge.
**BEHAVIOR OF THE SONIC BOOM SHOCK WAVE NEAR THE SONIC CUTOFF ALTITUDE.**
Contractor rept.,
by Manfred P. Friedman and David C. Chou. Dec 65, 43p
Contract NAS1-2511
NASA CR-358

Descriptors: (*Sonic boom, Shock waves), (*Shock waves, Sonic boom).

**N66-13291** **Field 20K, 22B**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**INVESTIGATION OF CHARACTERISTICS OF PRESSURE WAVES GENERATED IN WATER FILLED TANKS IMPACTED BY HIGH-VELOCITY PROJECTILES.**
Technical note,
by Francis S. Stepka, C. Robert Morse andRober. P. Dengler. Dec 65, 22p NASA-TN-D-3143

Descriptors: (*Projectiles, Impact shock), (*Shock waves, Propagation).

**NYO-1082-1** **Field 20H**
**CFSTI Prices: HC$2.00 MF$0.50**
Brown Univ., Providence. Dept. of Physics.
**REACTION STUDIES WITH FAST NEUTRONS.**
Progress rept. for 31 Oct 64,
by R. A. Peck, Jr. and D. R. Maxson. 1 Nov 64, 28p
Contract AT (30-1)-1082

Descriptors: (*Fast neutrons, Nuclear reactions), (*Charged particles, Fast neutrons).

NYO-2262-86 Field 20H
CFSTI Prices: HC$3.00 MF$0.75
Brown Univ., Providence, R. I.
**ELASTIC SCATTERING OF NEGATIVE PIONS BY PROTONS AT 903 MEV.**
Internal rept no. 108. (Master's thesis),
by Merlin Gene Taylor. Feb 65, 58p
Contract AT (30-1)-2262
Submitted to Brown Univ. Jun 1965.

Descriptors: (*Elastic scattering, Pions), (*Protons, Elastic scattering).

NYO-2811-21 Field 20B
CFSTI Prices: HC$3.00 MF$0.75
International Business Machines Corp., Yorktown Heights, N. Y.
**ANELASTIC RELAXATIONS DUE TO POINT DEFECTS IN CRYSTALS,**
by B. S. Berry. 2 Feb 65, 54p RR-1350
Contract AT (30-1)-2811

Descriptors: (*Relaxation time, Crystals), (*Crystals, Defects (Materials)).

NYO-2811-23 Field 20B
CFSTI Prices: HC$3.00 MF$0.75
International Business Machines Corp., Yorktown Heights, N. Y.
**DEFECTS IN CRYSTALS.**
Annual rept., 15 Mar 64-15 Feb 65,
by A. S. Nowick. 15 Feb 65, 84p
Contract AT (30-1)-2811

Descriptors: (*Crystals, Defects (Materials)), (*Metals, Crystal structure).

NYO-3114-5 Field 20D
CFSTI Prices: HC$2.00 MF$0.50
Dartmouth Coll., Hanover, N. H.
**TWO-PHASE FLOW AND BOILING HEAT TRANSFER.**
Quarterly progress rept. Oct-Dec 64,
by G. B. Wallis, J. M. Turner, P. E. Meyer, andD. E. Runce. Jan 65, 32p EURAEC-1329
Contract AT (30-1)-3114-1

Descriptors: (*Two-phase flow, Heat transfer), (*Heat transfer, Fluid flow).

ORNL-3858, Vol. 1 Field 20H, 18F
CFSTI Prices: HC$2.00 MF$0.50
Oak Ridge National Lab., Tenn.
**NEUTRON PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING AUGUST 1, 1965.**
Nov 65, 26p
Contract W-7405-eng-26

Descriptors: (*Nuclear physics, Scientific research), (*Shielding, Theory).

ORNL-3858, Vol. 2 Field 20H, 18K, 18D, 9B
CFSTI Prices: HC$3.00 MF$0.75
Oak Ridge National Lab., Tenn.
**NEUTRON PHYSICS DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING AUGUST 1, 1965.**
Nov 65, 79p
Contract W-7405-eng-26

Descriptors: (*Nuclear physics, Scientific research).

PB-169 142 Field 20K, 14B
CFSTI Prices: HC$1.00 MF$0.50
Illinois Univ., Urbana. Dept. of Theoretical and Applied Mechanics.
**DYNAMIC STRESS CONCENTRATION USING PHOTOELASTICITY AND A LASER LIGHT SOURCE,**
by W. P. T. North and C. E. Taylor. Sep 65, 19p
Rept. no. T/AM-285
Grant NSF-GK-70

Descriptors: (*Stresses, Test methods), (*Photoelasticity, Monochromatic light), (*Lasers, Photoelasticity), Structural parts, Photographic analysis, Kerr cells, Modulators, Light pulses, Loading (Mechanics), Defects (Materials).

Since experimental techniques using dynamic photoelasticity are in general limited by suitably intense monochromatic light sources, it was of primary importance to describe a ruby laser system which would completely remove this particular aspect of the problem. Modulation of the system, in this case by a Kerr cell, provides the necessary control of the light output such that a complete series of results can be obtained by putting together the results of many individual tests recorded on a conventional still camera. In this case the dynamic stress concentration factor in a strut with a symmetrically located circular discontinuity was determined to definitely establish the potential of the system. (Author)

PB-169 161 Field 20H, 20E
CFSTI Prices: HC$1.00 MF$0.50
Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
**PROCESSUS MULTIPHOTONIQUES PROGQUES PAR UN LASER (MULTI-PHOTON PROCESSES BROUGHT ABOUT BY A LASER),**
by Pierre Nelson. Dec 65, 25p CEA-R-2888
Text in French; Attached Summary in English.

Descriptors: (*Photonuclear reactions, Lasers), (*Lasers, Photons), Compton scattering, Bremsstrahlung, Photoelectric effect, Refractive index, France.

The critical intensity is calculated characterizing the multiphoton processes. The multiphoton effects corresponding to the Compton scattering, the bremsstrahlung, the photoelectric effect are investigated. The cross sections are evaluated. It is shown that the introduction of a refractive index, in clothing the photons, allows the elimination of the infrared divergence. The theory seems consistent with experiment. (Author)

PB-169 188 Field 20I
CFSTI Prices: HC$2.00 MF$0.50
Institute of Plasma Physics, Nagoya Univ. (Japan).
**COLLISION-INDUCED INSTABILITY IN A MAGNETOACTIVE PLASMA.**
Research rept.,
by Noboru Shimomura, Kenji Mitani, andShigetoshi Tanaka. Nov 65, 34p IPPJ-43

Descriptors: (*Plasma medium, Stability), Electromagnetic waves, Plasma oscillations, Magnetic fields.

Identifiers: Dispersion relations.

The dispersion relations for the waves propagating in a magnetoactive plasma are obtained from the Boltzmann equation with a collision term of the electrons. Two cases in which the wave vector parallel and perpendicular to a uniform magnetic field are studied. Assuming a delta -function for velocity distribution function, in each case, two dispersion relations for the zeroth approximation are derived.

PB-169 189 Field 20I, 4A
CFSTI Prices: HC$1.00 MF$0.50
Institute of Plasma Physics, Nagoya Univ. (Japan).
**MEASUREMENT OF THE EXCITATION FUNCTION OF N (2+) FIRST NEGATIVE BANDS BY ELECTRON IMPACT.**
Research rept.,
by Satio Hayakawa, Tiaki Kumazaki, Hiroyuki Nishimura, and Masamoto Otsuka. Sep 65, 19p IPPJ-42

Descriptors: (*Excitation, Nitrogen), (*Electron bombardment, Excitation), Plasma medium, Ionosphere, Secondary emission, Aurorae, Cosmic rays, Functions.

The intensities of lines belonging to the first negative bands of N (2 ;) were measured as a function of the energy of bombarding electrons and the pressure of nitrogen gas. The comparison of the intensities of various lines around 4000 A with and without an interference filter demonstrated that the filter transparent at 3940 plus or minus 100 A is good enough to select the 3914 line from others, provided that the gas pressure is lower than 0.001 Torr. As the pressure increases, secondary electrons produced in the gas were found to contribute to the excitation. This can be accounted for in terms of the conventional theory of the secondary electron production and the energy dependence of the excitation cross section of the 3914 line. The latter was found to be approximately reproduced by an empirical formula proposed by Drawin. (Author)

SLAC-48 Field 20G, 20H
CFSTI Prices: HC$4.00 MF$0.75
Stanford Linear Accelerator Center, Stanford Univ., Calif.
**TWO-MILE ACCELERATOR PROJECT.**
Quarterly status rept., 1 Apr-30 Jun 65.
Aug 65, 112p
Contract AT (04-3)-515

Descriptors: (*Electron accelerators, Linear accelerators).

SLAC-50 Field 20G
CFSTI Prices: HC$3.00 MF$0.75
Stanford Linear Accelerator Center, Stanford Univ., Calif.
**CONSOLIDATION OF RESULTS OF PRELIMINARY BEAM TESTS WITH SECTORE 1 AND 2.**
Sep 65, 98p
Contract AT (04-3)-400

Descriptors: (*Electron beams, Particle accelerators), (*Klystrons, Electron beams).

UCRL-12359 Field 20J, 12A
CFSTI Prices: HC$3.00 MF$0.75
Lawrence Radiation Lab., Univ. of California, Livermore.
**WIGNERS ANALYSIS OF THE UNITARY REPRESENTA- TIONS OF THE POINCARE GROUP,**
by Francis R. Halpern and Elbert Branscomb. 9 Sep 65, 61p
Contract W-7405-eng-48

Descriptors: (*Quantum mechanics, Groups (Mathe matics)), (*Groups (Mathematics), Quantum mechanics).

UCRL-14287 Field 20B
CFSTI Prices: HC$2.00 MF$0.50
Lawrence Radiation Lab., Univ. of California, Livermore.
**LATTICE MODELS FOR COOPERATIVE PHENOMENA. I. SURVEY AND COMPARISON OF APPROXIMATE METHODS,**
by Stephen G. Brush and R. Kikuchi. 1 Sep 65, 47p
Contract W-7405-eng-48

Descriptors: (*Crystal lattices, Phase studies), (*Phase studies, Approximation (Mathematics)).

## 21. PROPULSION AND FUELS

**N65-30954** **Field 21H**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**FLIGHT-TEST TEMPERATURE DATA FOR AN ALTAIR-IIC1 ROCKET MOTOR,**
by James L. Raper. Aug 65, 28p NASA-TN-D-2953

Descriptors: (*Rocket motors, Flight testing).

**N65-35394** **Field 21D**
**CFSTI Price: MF$0.75**
National Aeronautics and Space Administration, Washington, D. C.
**HANDLING HAZARDOUS MATERIALS.**
Technology Survey,
ed. by D. R. Cloyd and W. J. Murphy. Sep 65, 101p NASA-SP-5032
Hardcopy available from Superintendent of Documents, GPO, Washington, D. C., 20402, $0.45.

Descriptors: (*Materials, Handling), Hazards.

**N65-36896** **Field 21H**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**THRUST COEFFICIENTS OF LOW-THRUST NOZZLES,**
by Ernie W. Spisz, Paul F. Brinich and John R. Jack. Oct 65, 29p NASA-TN-D-3056

Descriptors: (*Thrust, Nozzles).

**N66-10747** **Field 21F, 18J, 21H**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**WHEEL-FLOW GASEOUS-CORE REACTOR CONCEPT.**
Technical note,
by John C. Evvard. Nov 65, 11p NASA-TN-D-2951

Descriptors: (*Nuclear propulsion, Gases), (*Reactor cores, Gases), (*Uranium, Gases), Rocket motors.

## 22. SPACE TECHNOLOGY

**N65-23781** **Field 22C, 17G**
**CFSTI Prices: HC$4.00 MF$0.75**
National Aeronautics and Space Administration, Huntsville, Ala. Marshall Space Flight Center.
**ASTRIONICS RESEARCH AND DEVELOPMENT.**
Rept. no 3, Jan 1-Dec 31 64,
by Hubert E. Kroh and Jeanene Flowers. 1 Mar 65, 103p
NASA TM-X-53217

Descriptors: (*Space flight, Celestial guidance), (*Celestial navigation, Space flight).

**N65-36773** **Field 22C, 17G**
**CFSTI Prices: HC$2.00 MF$0.50**
Bunker-Ramo Corp., Canoga Park, Calif.
**PILOT RE-ENTRY GUIDANCE AND CONTROL,**
by Albert B. Miller. Nov 65, 45p
Contract NASw-869
NASA CR-331

Descriptors: (*Guidance, Atmosphere entry).

**N66-10604** **Field 22B**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**INFLUENCE OF THE BUMPER AND MAIN WALL MATERIAL ON THE EFFECTIVENESS OF SINGLE METEOROID BUMPERS.**
Technical note,
by Donald H. Humes. Nov 65, 29p NASA-TN-D-3104

Descriptors: (*Spacecraft, Protective coverings), (*Meteorites, Penetration).

Identifiers: Meteoroid bumpers.

**N66-10607** **Field 22C**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**COMPARISON OF DIRECT AND INDIRECT ASCENT MODES FOR THE 1969 MARS OPPORTUNITY WITH AN ATLAS-CENTAUR LAUNCH VEHICLE.**
Technical memo.,
by Tim J. Kreiter. Nov 65, 19p NASA-TM-X-1181

Descriptors: (*Ascent trajectories, Mars probes).

**N66-10748** **Field 22B**
**CFSTI Prices: HC$3.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**ANALYSIS OF LOW-TEMPERATURE DIRECT-CONDENSING VAPOR-CHAMBER FIN AND CONDUCTING FIN RADIATORS.**
Technical note,
by Henry C. Haller, Bruce G. Lindow andBruce M. Auer. Nov 65, 55p NASA-TN-D-3103

Descriptors: (*Radiators, Aerodynamic control surfaces), (*Spacecraft, Radiators).

Identifiers: Space radiators.

**N66-10749** **Field 22A, 22C**
**CFSTI Prices: HC$3.00 MF$0.50**
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marhsall Space Flight Center.
**MONTE CARLO APPROACH TO TOUCHDOWN DYNAMICS FOR SOFT LUNAR LANDING.**
Technical note,
by Robert E. Lavender. Nov 65, 52p NASA-TN-D-3117

Descriptors: (*Soft landings, Dynamics), (*Lunar craft, Soft landings).

**N66-11250** **Field 22C**
**CFSTI Prices: HC$4.00 MF$0.75**
Measurement Analysis Corp., Los Angeles, Calif.
**SPECTRAL ANALYSIS OF NONSTATIONARY SPACECRAFT VIBRATION DATA.**
Contractor rept.,
by Allan G. Piersol. Nov 65, 106p
Contract NAS5-4590
NASA CR-341

Descriptors: (*Spacecraft, Vibration), (*Vibration, Launching).

**N66-11253** **Field 22A, 17I, 3B**
**CFSTI Prices: HC$3.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**SENSITIVITY OF SHORT-PERIOD TRACKING DATA FROM A LUNAR SATELLITE TO THE LUNAR GRAVITATIONAL FIELD HARMONICS.**
Technical note,
by William R. Wells. Nov 65, 70p NASA-TN-D-3107

Descriptors: (*Lunar satellites, Tracking), (*Gravity, Lunar environment).

**N66-12137** **Field 22B**
**CFSTI Prices: HC$1.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**EVALUATION OF ONE TYPE OF FOLDABLE TUBE.**
Technical memo.,
by Laurnece W. Gertsma, James H. Dunn andErwin E. Kempke, Jr. Dec 65, 21p NASA-TM-X-1187

Descriptors: (*Spacecraft components, Flexible structures).

**N66-12150** **Field 22C**
**CFSTI Prices: HC$3.00 MF$0.75**
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
**PERFORMANCE ANALYSIS OF CHEMICAL STAGES IN THE 300 TO 400 SECOND SPECIFIC IMPULSE RANGE FOR INTERPLANETARY MISSIONS.**
Technical note,
by Walter H. Stafford and Carmen R. Catalfamo. Dec 65, 56p NASA-TN-D-3153

Descriptors: (*Interplanetary trajectories, Specific impulse).

**N66-12154** **Field 22A, 17G**
**CFSTI Prices: HC$3.00 MF$0.50**
National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
**A STUDY OF GEMINI-AGENA DOCKING USING A FIXED-BASE SIMULATOR EMPLOYING A CLOSED-CIRCUIT TELEVISION SYSTEM.**
Technical note,
by Donald R. Riley, Byron M. Jaquet, Richard E.Bardusch and Perry L. Deal. Dec 65, 52p NASA-TN-D-3112

Descriptors: (*Spacecraft docking, Simulators), (*Manned spacecraft, Spacecraft docking).

**N66-12157** **Field 22C, 10A**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**TORQUE REQUIREMENTS FOR ORIENTATION OF A SOLAR BRAYTON SYSTEM IN EARTH ORBIT.**
Technical note,
by Donald L. Sowers. Dec 65, 29p NASA-TN-D-3142

Descriptors: (*Solar cells, Brayton cycle), (*Torque, Spacecraft components).

**N66-12158** **Field 22B, 21H**
**CFSTI Prices: HC$2.00 MF$0.50**
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
**COMBINED HIGH-LOW THRUST PROPULSION FOR THE CLOSE SOLAR PROBE MISSION.**
Technical note,
by William C. Strack. Dec 65, 33p NASA-TN-D-145

Descriptors: (*Rocket propulsion, Space probes), (*Solar satellites, Thrust).

N66-12251 Field 22C
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Houston, Tex. Manned Spacecraft Center.
**SEPARATION TRAJECTORY CHARACTERISTICS RESULTING FROM SEPARATING TWO VEHICLES IN NEAR-EARTH ORBITS.**
Technical note,
by Ben F. McCreary. Dec 65, 32p NASA-TN-D-3069

Descriptors: (*Low-orbit trajectories, Manned spacecraft), (*Optical tracking, Space buoys), Rendezvous trajectories.

N66-12401-12428 Field 22A, 5A, 5I
CFSTI Prices: HC$1.50 MF$2.00
National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
**NASA UNIVERSITY PROGRAM REVIEW CONFERENCE, KANSAS CITY, MISSOURI. MARCH 1-3, 1965.**
3 Mar 65, 400p NASA-SP-85

Descriptors: (*Manned spacecraft, Scientific research), (*Astronautics, Research program administration), Education.

N66-13020 Field 22B, 9F
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Moffett Field, Calif. Mission Analysis Div.
**A FEASIBILITY STUDY OF A COMMUNICATIONS SATELLITE FOR DEEP-SPACE MONITORING.**
Technical note,
by George W. Clemens, Jr., Alfred C. Mascy, and Duane W. Dugan. Dec 65, 42p NASA-TN-D-3155

Descriptors: (*Communication satellites (Active), Monitors), (*Telemeter systems, Spacecraft).

N66-13047 Field 22B, 21H
CFSTI Prices: HC$5.00 MF$1.25
LTV Astronautics Div., Ling-Temco-Vought, Inc., Dallas, Tex.
**SCOUT MOTOR PERFORMANCE ANALYSIS AND PREDICTION STUDY (PAPS).**
Contractor rept.,
by C. K. Whitney, T. F. Owens, J. Paskind and M. B. Rubin. Dec 65, 183p
Contracts NAS1-3683, NAS1-3684
NASA CR-336
Prepared in cooperation with Thiokol Chemical Corp., Aerojet-General Corp. and Hercules Powder Co.

Descriptors: (*Launch vehicles (Aerospace), Rocket motors), (*Rocket motors, Launch vehicles (Aerospace)).

Identifiers: Scout.

N66-13229 Field 22C
CFSTI Prices: HC$2.00 MF$0.50
National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
**A GUIDANCE SCHEME FOR LUNAR DESCENT BASED ON LINEAR PERTURBATION THEORY.**
Technical note,
by Kenneth C. White and Phillips J. Tunnell. Dec 65, 38p NASA-TN-D-3147

Descriptors: (*Lunar satellites, Guidance), (*Descent trajectories, Perturbation theory).

N66-13230 Field 22B, 13A
CFSTI Prices: HC$4.00 MF$0.75
National Aeronautics and Space Administration, Houston, Tex. Manned Spacecraft Center.
**AN ANALYSIS OF CHARRING ABLATION THERMAL PROTECTION SYSTEM.**
Technical note,
by Donald M. Curry. Dec 65, 110p NASA-TN-D-3150

Descriptors: (*Ablation, Mathematical models), (*Aerodynamic heating, Heat shields).

Identifiers: Charring.

N66-13238 Field 22B
CFSTI Prices: HC$1.00 MF$0.50
National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
**PEGASUS SATELLITE MEASUREMENTS OF METEOROID PENETRATION (FEB. 16 - JULY 20, 1965).**
Technical memo.,
by Robert J. Naumann. Dec 65, 21p NASA-TM-X-1192

Descriptors: (*Meteorites, Penetration), (*Spacecraft, Meteorites).

Identifiers: Pegasus.

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The fields indicated here apply only to the Other Research Reports and Related Material Section (on blue paper).


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